A Comparison of the Effects of a Function-Based Intervention to a Non-Function-Based Intervention to Address Problem Behaviors in Preschoolers

Katherine Marie Bellone
University of Southern Mississippi

Follow this and additional works at: https://aquila.usm.edu/masters_theses
Part of the Child Psychology Commons, and the School Psychology Commons

Recommended Citation
Bellone, Katherine Marie, "A Comparison of the Effects of a Function-Based Intervention to a Non-Function-Based Intervention to Address Problem Behaviors in Preschoolers" (2011). Master's Theses. 223.
https://aquila.usm.edu/masters_theses/223

This Masters Thesis is brought to you for free and open access by The Aquila Digital Community. It has been accepted for inclusion in Master's Theses by an authorized administrator of The Aquila Digital Community. For more information, please contact Joshua.Cromwell@usm.edu.
A COMPARISON OF THE EFFECTS OF A FUNCTION-BASED INTERVENTION TO A NON-FUNCTION-BASED INTERVENTION TO ADDRESS PROBLEM BEHAVIORS IN PRESCHOOLERS

by

Katherine Marie Bellone

A Thesis
Submitted to the Graduate School of The University of Southern Mississippi in Partial Fulfillment of the Requirements for the Degree of Master of Arts

Approved:

Brad A. Dufrene
Director

Heather E. Sterling

D. Joe Olmi

Susan A. Siltanen
Dean of the Graduate School

December 2011
ABSTRACT

A COMPARISON OF THE EFFECTS OF A FUNCTION-BASED INTERVENTION TO A NON-FUNCTION-BASED INTERVENTION TO ADDRESS PROBLEM BEHAVIORS IN PRESCHOOLERS

by Katherine Marie Bellone

December 2011

Problem behaviors occur frequently among preschool children in classrooms, impeding academic development. Past methods employed for development of behavioral interventions include functional assessment and use of evidence-based practices. The current investigation sought to empirically compare the effectiveness of both function-based and non-function-based interventions to increase appropriate engagement and decrease occurrence of problem behaviors. Participants included three preschool children, two attending pre-kindergarten classrooms at an elementary school and one at a Head Start Center. Differential reinforcement of alternative behavior was used as the function-based intervention and was compared to a token economy intervention in an Alternating Treatments Design. Results indicated that the function-based intervention was more effective for two of the three participants and equally effective for the third participant. These results suggest that the treatment utility of functional assessment procedures may make the time needed for assessment worthwhile.
ACKNOWLEDGEMENTS

I would like to thank my thesis director, Dr. Brad Dufrene, and the other committee members, Dr. D. Joe Olmi and Dr. Heather Sterling, for their guidance and support throughout this project. Special thanks also go to Chandler McLemore, Jonna Halphen, Rachel Mitchell, and Aimee Maldonado for their assistance during data collection.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>ii</td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF ILLUSTRATIONS</td>
<td>v</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>I.   INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II.  REVIEW OF THE LITERATURE</td>
<td>6</td>
</tr>
<tr>
<td>Functional Assessment</td>
<td></td>
</tr>
<tr>
<td>Function-based Interventions</td>
<td></td>
</tr>
<tr>
<td>Token Economies</td>
<td></td>
</tr>
<tr>
<td>Purpose</td>
<td></td>
</tr>
<tr>
<td>Research Questions</td>
<td></td>
</tr>
<tr>
<td>III. METHOD</td>
<td>25</td>
</tr>
<tr>
<td>Participants and Settings</td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td></td>
</tr>
<tr>
<td>Dependent Measures</td>
<td></td>
</tr>
<tr>
<td>Design and Data Analysis</td>
<td></td>
</tr>
<tr>
<td>Procedures</td>
<td></td>
</tr>
<tr>
<td>Interobserver Agreement, Procedural Integrity, and Treatment Integrity</td>
<td></td>
</tr>
<tr>
<td>IV.  RESULTS</td>
<td>41</td>
</tr>
<tr>
<td>Functional Analysis</td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td></td>
</tr>
<tr>
<td>Acceptability</td>
<td></td>
</tr>
<tr>
<td>V.   DISCUSSION</td>
<td>55</td>
</tr>
<tr>
<td>Research Question 1</td>
<td></td>
</tr>
<tr>
<td>Research Question 2</td>
<td></td>
</tr>
<tr>
<td>Limitations</td>
<td></td>
</tr>
<tr>
<td>APPENDIXES</td>
<td>62</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>88</td>
</tr>
</tbody>
</table>
LIST OF ILLUSTRATIONS

Figure

1. Results of Melvin’s functional analysis...........................................42

2. Results of Elvin’s functional analysis..............................................44

3. Results of Adrian’s functional analysis..........................................45

4. Melvin’s level of appropriate engagement.....................................47

5. Melvin’s level of inappropriate vocalizations.................................48

6. Elvin’s level of appropriate engagement........................................50

7. Elvin’s level of inappropriate vocalizations....................................51

8. Adrian’s level of appropriate engagement.....................................52

9. Adrian’s level of inappropriate vocalizations.................................53
CHAPTER I
INTRODUCTION

Behavior problems in preschoolers may occur frequently and present difficulties within the classroom (Qi & Kaiser, 2003). Preschoolers’ behavior problems, even when identified early, often persist over time and can continue into late childhood and adolescence if not properly addressed (Campbell, 1995). Conduct problems in early childhood are stable and predictive of later behavior problems in school, often resulting in school dropout (Campbell, 1995). Furthermore, children from lower socioeconomic backgrounds are at an increased risk of developing behavior problems at a young age, as poverty is a strong predictor of negative outcomes for children (Webster-Stratton & Hammond, 1998). In their review article, Qi and Kaiser (2003) reported that approximately 30% of children from low socioeconomic backgrounds could be identified as having behavior problems as compared to 3 to 6% of children in the general population. The staggering prevalence rates of problem behaviors within this group clearly indicate the need for early and effective intervention.

Taking a developmental perspective, the transition from the preschool years to formal schooling marks a time of change that is particularly crucial. Children who enter school exhibiting problem behaviors may begin school in a disadvantaged situation that may impede future academic and social progress. Misbehavior in the classroom will affect a teacher’s engagement with the student who exhibits problem behaviors, altering the quality of the educational experience. In an empirical investigation of teacher behaviors, Carr, Taylor, and Robinson (1991) found that classroom teachers changed their level of engagement with students based on the student’s behavior. Teachers were
each assigned a pair of students, one student who had been identified as having behavior problems and one student who did not have behavior problems. Teachers delivered task demands at a lower rate to children with behavior problems than to children without behavior problems. In addition to presenting the child with fewer opportunities to respond, teachers were more likely to change the type and content of the task demands given to the child with behavior problems in an attempt to avoid misbehavior. Due to the stability and developmental context of behavior problems in preschool populations, there is an obvious need for effective interventions to address and minimize these behavior problems before detrimental effects to the child’s future occur.

One method of developing interventions to address problem behaviors is functional assessment. According to Gresham, Watson, and Skinner (2001), functional assessment is “the full range of procedures that can be used to identify the antecedents and consequences associated with the occurrence of behavior” (p. 158). A functional assessment may include a teacher interview, direct observations of the behavior, and an experimental functional analysis (Gresham et al., 2001). The information gained from a functional assessment can be used directly to develop an individualized, targeted intervention that will address the cause of a problem behavior and decrease its occurrence. Function-based interventions have received much attention in recent years due to the expectation that such interventions will be highly effective due to the nature of their development.

Functional assessment procedures fall into one of three categories. The three categories of functional assessment procedures are (a) indirect functional assessment procedures, (b) direct-descriptive functional assessment procedures, and (c) experimental
functional analysis procedures. Indirect functional assessment procedures are removed in time and place from the actual occurrence of the behavior, often taking place long after the behavior’s occurrence. Such procedures can include interviews with teachers and parents, records reviews, and behavioral rating scales and checklists (Gresham et al., 2001).

The second category of procedures, direct-descriptive methods, occurs at the time and place of the behavior. One common procedure used is an Antecedent-Behavior-Consequence (ABC) observation. During an ABC observation, the behavior is observed, usually in multiple settings, and all events that occur immediately before (i.e., antecedents) and after (i.e., consequences) are recorded in a narrative format. Interval-based recording procedures may also be used to conduct direct-descriptive assessments. Interval recording procedures allow for calculation of conditional probabilities which provide an estimate of the extent to which a behavior is preceded by some antecedent event and followed by some consequent event (Gresham et al., 2001).

The third category of procedures that can be used in the functional assessment process is experimental functional analysis which stems from the work of Iwata, Dorsey, Slifer, Bauman, and Richman (1982). Experimental procedures involve exposing an individual to possible antecedent and consequent events that may be maintaining the behavior of interest. Typically, the conditions included for analysis include access to attention, access to tangibles, escape from task demands, and automatic reinforcement, in addition to a control condition. The assessment can be done in an extended format, in which the individual is exposed to each condition multiple times, or a brief format, in which each condition is tested once. Experimental methods allow for stronger,
conclusive statements of behavioral function due to the experimental nature of the procedure (Gresham et al., 2001).

Beyond interventions based on functional assessment, there are established evidence-based practices that have been demonstrated to be effective in the literature base. One such evidence-based practice is the token economy. In past research, token economies have been shown to be effective in a multitude of settings and with many different age groups (Kazdin & Bootzin, 1972; O’Leary & Drabman, 1971). One population that has received attention in recent investigations using token economies is preschoolers, due to the interest in early intervention to address behavior problems. In particular, token economies have been shown to be effective for increasing prosocial behaviors and decreasing problematic behaviors in preschool populations (Filcheck, McNeil, Greco, & Bernard, 2004; McGoey & Dupaul, 2000; Reitman, Murphy, Hupp, & O’Callaghan, 2004; Wolfe, Adlai Boyd, & Wolfe, 1983).

When choosing an intervention, several considerations must be made. One such consideration is effectiveness, yet time requirements must also be taken into account. Interventions based on functional assessment information have been shown to effectively address problem behaviors across many behavioral topographies, participant demographics, and settings (Carr, Robinson, Taylor, & Carlson, 1990; Kern, Choutka, & Sokol, 2002). Despite these positive attributes, developing an individualized intervention based on a functional assessment demands more of the practitioner’s time than choosing an evidence-based practice, such as the token economy. Therefore, a direct empirical comparison between an intervention based on functional assessment and one based on an empirically-supported practice is warranted. Though much research states the need for
such comparisons, there is a lack of direct comparisons between function-based interventions and non-function based interventions. Furthermore, the studies comparing function-based to non-function-based interventions present limited findings. The following review of the literature will describe functional assessment, function-based interventions, and token economies as they relate to service provision for preschoolers.
CHAPTER II

REVIEW OF THE LITERATURE

Functional Assessment

One of the first articles to address the idea of behavioral functions is presented by Carr (1977). The author considered five possible maintaining variables of self-injurious behavior identified in the literature, including positive reinforcement, negative reinforcement, self-stimulation, physiological or organic causes, and psychodynamic processes (e.g. guilt reduction, establishment of ego boundaries). After eliminating psychodynamic processes, Carr divided the remaining four functions into extrinsically and intrinsically-oriented factors and emphasized the direct treatment implications that both categories hold. Most importantly, by combining the existing theories on the functions of behavior, Carr encouraged the empirical study of the “motivations” of behavior and set the stage for Iwata et al.’s (1982) seminal article that eventually formed the experimental conditions of functional analysis.

Based on the hypotheses offered by Carr (1977), especially the idea that behaviors may be maintained by external variables such as access to attention or escape from tasks, Iwata et al. (1982) manipulated environmental conditions to measure the differential effects of these variables on the occurrence of target behaviors, specifically self-injurious behaviors (SIB). Iwata et al. had nine subjects with varying severities of developmental disabilities who all engaged in moderate to high rates of SIB. The study included four conditions under which to measure occurrence of SIB with each condition corresponding to a hypothesis set forth by Carr. The four conditions tested were social disapproval, academic demand, unstructured play, and alone. In the social disapproval condition,
subjects received verbal and physical attention contingent upon exhibiting the target behavior to evaluate those behaviors that are maintained through positive reinforcement in the form of access to social attention. The academic demand condition involved termination of a task demand contingent on the occurrence of the target behavior to evaluate those behaviors that are maintained through negative reinforcement in the form of escape from a task demand. In the unstructured play condition, subjects had unrestricted access to toys and received positive attention for appropriate behavior in order to produce an “enriched environment” that served as a control condition. Finally, the alone condition was one in which subjects were placed in a room without access to toys or attention in order to measure whether the SIB was maintained through self-stimulation or internal sensory reinforcement. Iwata et al. found that the conditions that maintain behaviors are largely idiographic, and this provided empirical support for the notion that behavior across persons can be a function of different sources of reinforcement. Beyond providing the first empirical investigation of functions of behavior, Iwata et al. also provided a methodology to examine the effects of environmental variables on occurrences of behavior. The authors also suggested that by identifying the underlying function of a behavior, effective treatment and intervention decisions could be made.

As demonstrated in the work of Carr (1977) and Iwata et al. (1982), traditional uses of functional assessment were limited to residential settings with individuals with developmental disabilities who exhibited self-injurious behavior. It is only recently that the methodologies of functional assessment have been applied to broader populations and settings. A review of the literature on school-based use of functional assessment revealed
that nearly 90% of participants in the reviewed studies were identified as having at least one disability with the most common diagnosis being intellectual disability (Ervin et al., 2001). Although this reflects the trends of the past, the use of functional assessment in populations without disabilities is increasing (Gresham et al., 2001).

To explore the use of functional assessment methodology in practice, Blakeslee, Sugai and Gruba (1994) provided a review article to examine the use of functional assessment in behavioral research and practice. The authors presented many positive outcomes associated with the use of functional assessment during intervention planning, including increased likelihood of beneficial treatment effects for individuals with behavior problems. The review revealed that functional assessment was used infrequently in behavioral research and by clinicians; however, when functional assessments were conducted, the data gained from the assessment were often directly linked to intervention planning and selection. The authors suggested that future research investigate whether using functional assessment methodology does indeed improve intervention effectiveness and outcomes for clients, as well as to compare functional approaches to other treatment approaches.

In a more recent exploration, Ervin et al. (2001) reviewed the functional assessment literature as it related to school-based use. The authors identified several areas that are not adequately addressed in the current school-based functional assessment literature. The areas identified included consensus on methodology, acceptability to school personnel, and relevance of functional assessment in comparison to other methods of designing interventions. Their findings indicated that the majority (89%) of participants included in the studies that were reviewed had been previously diagnosed
with a disability, which led the authors to emphasize the importance of conducting functional assessment research in children without disabilities. The authors concluded that the shortcomings of the literature in no way limit the merit of functional assessment and instead, stated that in every condition under which functional assessment has been tested, it has been proven to be a practical and valuable method for determining the causes of problem behaviors and developing effective interventions.

Gresham et al. (2004) provided a review of school-based intervention articles as they relate to the use of functional assessment. The authors sought to determine whether interventions matched to behavioral function were more effective than interventions not linked to behavioral function. Based on the results of their literature review, the authors concluded that function-based interventions were no more effective than those that were not based on functional assessment through their calculation of effect sizes and percentage of non-overlapping data (PND). However, PND calculations are easily skewed by trends in data series and effect size calculations are often not meaningful when linked to practical significance. Therefore, due to the inherent validity issues involved in using and interpreting these statistical measures, the findings must be viewed with caution. Also, the authors cited the possibility that the studies that employed non-function-based interventions represent a biased sample in that those studies with strong effects are published more frequently than studies with weaker effects, which may have inflated the overall effect size of the non-function-based interventions. Taking all of this information into consideration, a direct empirical comparison of function-based behavioral interventions to those not based on functional assessment data is warranted and would address some of the limitations discussed.
Function-Based Interventions

As described frequently in the functional assessment literature, function-based interventions are expected to be highly effective due to the nature of the intervention planning process. By devising an intervention that is based on the hypothesized controlling variables of the problem behavior, an effective treatment can be developed (Carr et al., 1990; Kern, Choutka, & Sokol, 2002). As Carr et al. (1990) stated, “Functional analysis and hypothesis-driven treatment constitute a method for deducing plausible intervention strategies in a systematic and rational manner” (p. 23). In other words, knowing the environmental factors that evoke or control behavior allows for manipulation of the environment in order to reduce a problem behavior while increasing a replacement behavior.

Gresham et al. (2001) provided a comprehensive description of various procedures involved in functional behavioral assessment. Moreover, a description of interventions that are based on functional assessments was provided. Function-based interventions fall into one of two strategies implemented in isolation or combination: (a) weakening the relationship between the maintaining variable (reinforcer) and a maladaptive response or (b) strengthening the relationship between an adaptive response and a reinforcer. The authors suggested that many classroom interventions may be ineffective because interventions that lack a functional relationship with the behavior are chosen. Several problems can arise from the use of interventions which do not take into account the function of a behavior including strengthening a problem behavior and not providing sources of reinforcement for appropriate behavior. The authors emphasized
that future research should investigate whether interventions linked to functions of behavior are more effective than interventions not linked to functional assessments.

Basing behavioral interventions on information gained from a functional assessment is not a new application. Function-based interventions have been effectively used with a range of individuals, presenting problems, and settings. Historically, functional assessment research was widely conducted in residential facilities to devise interventions to improve outcomes for individuals with developmental disabilities (Carr, 1977; Iwata et al., 1982). Although this continues to be a population for which function-based interventions prove relevant, the use of functional assessment for intervention design and development has broadened to other populations and settings, including children with emotional and behavioral disorders in regular and special education settings (Lane et al., 2009; Smith & Sugai, 2000) and children with attention-deficit/hyperactivity disorder in regular and special education settings (Northup et al., 1995; Stahr, Cushing, Lane & Fox, 2006; Umbreit, 1995).

Although the extension of functional assessment-based interventions to general education settings with children without severe disabilities is promising, less has been done with the preschool population. In one study, Boyajian, DuPaul, Handler, Eckert, and McGoe (2001) demonstrated the effectiveness of a functional assessment-based intervention to decrease aggressive behavior in three preschoolers at-risk for ADHD. The authors conducted the functional assessment through teacher interview and a brief functional analysis. The analysis revealed that each child’s inappropriate behaviors were maintained by a different function, access to attention for one, access to tangibles for another, and escape from task demands for the final preschooler. Based on the
assessment, a combined antecedent and consequent-based intervention was designed for each child, which included a prompt for appropriate behavior and the indicated consequence. The interventions resulted in immediate behavior changes for all three children and zero or near-zero occurrence of the problem behavior for the duration of the study. The use of functional assessment to design interventions for preschool children in general education settings was clearly supported. However, function-based interventions were not compared to other empirically supported approaches.

Another investigation demonstrating the effectiveness of function-based interventions for preschoolers was conducted by VanDerHeyden, Witt, and Gatti (2001). The authors examined the use of descriptive assessments for intervention development to address disruptive behavior in two preschool classrooms, one in a center for children with speech and language disorders and one in a Head Start classroom. Functional assessments were conducted with the class as the unit of analysis, as opposed to individual children. Additionally, the function-based interventions targeted the entire class with a group contingency.

To conduct the functional assessment, child and teacher behaviors were observed and conditional probability assessments were conducted to determine the hypothesized function of behavior. An alternating treatments design was used to evaluate two different interventions that were developed from the functional assessment information. The results of the investigation indicated that disruptive behavior occurred less frequently during the function-based treatment than during a contraindicated treatment for both classrooms. The results supported the use of descriptive assessments to develop effective behavioral interventions and presented the successful use of functional assessment and
intervention within the preschool population in the naturalistic environment. It is important to note that function-based interventions were compared to contraindicated interventions (e.g., providing reprimands contingent upon disruptive behavior maintained by access to attention). As a result, it is not known if another evidence-based procedure would have been as successful as the function-based interventions.

As mentioned, relatively few functional assessment studies have included direct comparisons of function-based and non-function-based interventions. However, there is an emerging literature directly comparing function-based interventions to other procedures. One such investigation is found in Ellingson, Miltenberger, Stricker, Galensky, and Garlinghouse (2000), which examined the use of function-based interventions in the classroom by teachers and compares the effects of a function-based intervention to a non-function-based intervention. The researchers conducted a functional assessment in two phases. In phase one, teachers completed a behavioral questionnaire without assistance or feedback from the researchers. Then, an interview was conducted by the first author with the same teacher that completed the questionnaire to clarify any unclear information. ABC observations were conducted, one by the classroom teacher and one by a trained research assistant during the same observation period. For phase two, the hypotheses developed during the procedures of phase one were tested using a brief reversal design (ABACBC). The phases of the design were as follows: (a) Baseline, (b) a function-based intervention, and (c) an intervention based on a function not identified in phase one, but likely to be used in a typical classroom. Specifically, the non-function-based intervention involved prompting for one participant,
altering the physical environment of the student’s desk for another participant, and physical redirection for the third participant.

Ellingson et al.’s (2000) results indicated that the function-based intervention was more effective than the non-function-based intervention for one of the three participants, but the results for the other two participants were less clear. The main limitation identified by the authors was the possible information lost through the brief experimental design. The authors discussed the inconsistencies in their results, however it should be noted that the functional interventions were often multi-component approaches to address the problem behavior as compared to the nonfunctional intervention, which often only had one component. Despite a successful demonstration of teachers’ use of functional assessment methodologies, in order to compare effectiveness of interventions, a more direct, balanced comparison is necessary.

Ingram, Lewis-Palmer, and Sugai (2005) conducted a systematic replication of Ellingson et al. (2000) with several changes, namely different participant demographics and involvement of an expert panel to evaluate the behavior interventions. The purpose was to examine the effectiveness of a behavior intervention based on functional assessment information in comparison to an intervention not based on information gained through a functional assessment. The participants were two boys in a general education sixth grade class. The researchers developed two behavior intervention plans (BIPs) after conducting a functional behavioral assessment that included a teacher interview, a student interview, and direct observations. Both BIPs had four components, each to address a different aspect of behavioral occurrence: setting event, antecedent, consequence for the problem behavior, and consequence for the replacement behavior. One BIP was based on
the information gathered during the functional assessment and the other BIP was
developed based on variables not supported by the hypothesized function of the problem
behavior. Specifically, the non-function-based intervention involved components that
were empirically supported but not indicated by the functional assessment. For example,
for a child who was found to have escape-maintained off-task behavior, the teacher
ignored the occurrence of the problem behavior and praised the child when he engaged in
a task-related behavior. An expert panel independently evaluated each BIP for technical
adequacy and match to the hypothesized behavioral function. The researchers utilized an
ABCBC design with counterbalancing of conditions to compare the occurrence of the
problem behaviors under each BIP.

The results of Ingram et al.’s (2005) investigation indicated that decreases in the
occurrence of problem behaviors occurred for both participants under both BIPs;
however, the treatment effects demonstrated more stability and greater decreases under
the function-based BIP. The authors concluded that interventions based on functional
assessment information may be more effective at reducing problem behaviors than non-
function-based interventions. Also, the functional assessment and BIP processes were
successfully used with high-functioning students in a general education setting. A third
conclusion made by the authors was that descriptive procedures were useful in the
development of effective interventions.

Despite the strong conclusions offered by Ingram et al. (2005), several limitations
must be noted. One of the main concerns is that no functional analyses were conducted
to confirm the hypothesized functions of behavior for the two participants. Therefore, it
is possible that the treatment effects under the function-based BIP may have been
stronger if the results of a functional analysis would have been taken into account. Also, the expert rating form that was used to evaluate the BIPs was developed by the researchers for the purpose of the study and was not evaluated for technical adequacy (i.e., reliability, validity). In a measure of social validity, teachers rated the two BIPs similarly on effort and intrusiveness however, the teachers stated that they were uncomfortable ignoring the problem behavior, which was the consequence for behavior in both non-functional BIPs. Thus, the question is raised as to whether this is an appropriate comparison, considering that teachers were uncomfortable with the consequent procedure involved in the non-function-based BIPs. Another concern with the comparison is that the interventions were multi-component. Based on that, it is difficult to determine whether the comparison being made is truly that of a function-based intervention to a non-function based intervention because multiple elements were manipulated simultaneously. Thus, even though the results supported the superiority of function-based interventions, additional evidence is needed to compare function-based interventions to interventions not matched to behavioral function.

In a similar investigation, Newcomer and Lewis (2004) sought to examine the effectiveness of function-based interventions to address behavior problems with three elementary students in a general education setting. The researchers generated a hypothesis for the possible function of the problem behavior and designed an intervention based on function. To develop the behavioral hypotheses, the researchers conducted a descriptive functional assessment consisting of an interview, rating scales, and direct observations (i.e., ABC observations). Next, an experimental analysis was completed to directly manipulate the relevant antecedent and consequent variables identified during the
descriptive assessment. The hypotheses developed in the descriptive analyses were confirmed during the functional analyses. Overall, there was consistency of results across methods. A multiple baseline design across participants was used to compare the effectiveness of a function-based intervention to one that was non-function-based. The function-based intervention involved a behavior support plan with an antecedent component, a reinforcement component, and a consequent component to minimize the occurrence of problem behaviors. The non-function-based intervention was based on the topography of the behavior but not tied to the results of the analysis. Where applicable, the alternative intervention built upon existing behavior management systems within the classroom. For example, the non-function-based intervention for one student who was found to have escape-maintained behavior was a prompting procedure. The interventions were developed collaboratively between the teacher and the primary investigator, however the non-function-based interventions were largely chosen by the teacher.

In their investigation, Newcomer and Lewis (2004) found that the function-based interventions were more effective at reducing problem behavior than the alternative non-function-based interventions for two of the three participants. The third student also exhibited greater reductions in problem behavior with the function-based intervention but she had a lower baseline level of occurrence, which did not allow for as clear a conclusion as the other two participants. The authors stated several limitations inherent in the experimental design, including threats to internal validity and an order effect in which the function-based intervention always followed the non-function-based intervention. Another limitation is that treatment integrity data were not collected to ensure that the interventions were implemented as designed. Once again, the function-
based intervention had more components than the non-function-based intervention, presenting an unequal comparison.

Another investigation of the use of functional assessment to develop behavioral interventions within a school setting is found in Dufrene, Doggett, Henington, and Watson (2007). The participants were three 5-year old children enrolled in a preschool or Head Start program. The functional assessment process began with administration of the Functional Assessment Informant Record for Teachers-Preschool Version. Direct-descriptive observations were conducted, including a conditional probability assessment. Finally, an abbreviated functional analysis was used to confirm the hypothesized function of the problem behavior for each student. Based on the results of the functional assessment, two experimental conditions were developed. The two conditions that were compared in an ABAB design were (A) a functional reinforcer delivered contingent on occurrence of the target behavior and (B) a functional reinforcer delivered for non-occurrence of the target behavior. Interventions were implemented by both the researcher and the classroom teacher.

The results of Dufrene et al.’s (2007) investigation showed that occurrence of the target problem behavior decreased under the function-based intervention condition. This demonstrates the effectiveness of interventions linked to functional assessment information in reducing problem behavior in preschool children. Another contribution of this study to the literature base is that the researchers used functional assessment in a preschool population with children without developmental disabilities, which was, and continues to be, an area of scarce research. Several limitations were noted, including the nature of the abbreviated functional analyses and the lack of tracking appropriate
behavior during data collection. The results, however, are important in demonstrating the utility of functional assessment in intervention development, as stated here “[f]unctional assessment offers the potential for direct assessments of student behavior that may be linked to effective early intervention for preschool children at-risk for behavioral difficulties” (Dufrene et al., 2007, p. 384).

In summary, functional assessment seems to be useful for intervention development across multiple settings and populations. Despite the strong research base on functional assessment and function-based interventions, there are several deficits in the literature that must be noted. Even though there are a plethora of investigations with other age groups, there are only a handful of investigations of functional assessment-based interventions for preschoolers (e.g., Boyajian et al., 2001; Dufrene et al., 2007; VanDerHeyden et al., 2001). Another area in need of more research is the relative effectiveness of function-based interventions when compared to other methods of intervention. Generally, there is a lack of direct comparisons between function-based interventions and non-function-based interventions. Past comparisons have often been unbalanced, such that the function-based intervention was either more comprehensive or included more components than the single-component, non-function-based procedure. The lack of equality in comparison may increase the likelihood of the function-based procedure appearing superior due to lack of appropriate comparison rather than a true superiority of effect. One method of comparison that may provide a more balanced and direct comparison would be including an evidence-based practice in comparing the differential effectiveness of the two interventions.
Token Economies

Beyond using functional assessment to develop interventions, evidence-based practices offer another option when designing effective behavioral interventions. One such evidence-based practice is the token economy. As demonstrated in past research, token economies are an effective intervention that have been applied to a broad array of populations, including individuals with developmental and intellectual disabilities as well as typically developing individuals, and in a wide range of settings, including inpatient settings, correctional facilities, and schools (Kazdin & Bootzin, 1972; O’Leary & Drabman, 1971).

In their review of classroom-based token economies, O’Leary and Drabman (1971) described the “ingredients” of a token reinforcement system as (a) rules for appropriate behavior, (b) the means of reinforcement contingent on appropriate behavior (the token), and (c) rules for exchanging the token for primary or back-up reinforcers. Common classroom reinforcers, for which the tokens can be exchanged, include stickers, small trinkets, and candy. Kazdin and Bootzin (1972) discussed several benefits of using conditioned reinforcers (tokens) including bridging the time delay between the appropriate behavior and the reinforcer, permitting reinforcement of appropriate behavior at any time, avoiding satiation effects, and providing reinforcement to children who have widely different preferences. Token systems in the classroom have been used effectively to improve academic, social, and behavioral outcomes for children and young adults.

One early example of the use of a token economy system within the classroom is found in Wolfe, Adlai Boyd, and Wolfe (1983), in which the social interactions of preschool children with behavior problems were improved through the use of a token
reinforcement program. The authors implemented a token economy with three preschool children who exhibited high rates of aggressive and socially inappropriate behavior during playtime. The token economy system involved a sticker chart in which happy face stickers served as the tokens and children were rewarded for each minute of appropriate social play during a specified playtime. If a criterion number of stickers was met, the child earned extra time outside. All three children increased time spent in appropriate social interaction when the token economy was in place. Also, even after a fading procedure was put into place and the tokens were withdrawn, positive behavior changes were maintained.

More recent investigations of the use of token economy systems with preschool populations have been conducted. McGoey and DuPaul (2000) compared the effectiveness of a token reinforcement program to a response cost procedure in reducing disruptive behaviors in four preschoolers who had been diagnosed with attention-deficit/hyperactivity disorder (ADHD). For the token reinforcement intervention, the children could earn buttons which were displayed on a chart when the teacher observed the child to be exhibiting an appropriate behavior, as determined by the classroom rules. If the child met the preset criterion for buttons, stickers or hand stamps were earned. The token intervention was compared to a response cost procedure in which the children lost buttons for their charts for not following classroom rules. Both interventions were found to be equally effective in reducing the disruptive behaviors of all three participants. Also, the token reinforcement intervention was rated as highly acceptable and was perceived by the classroom teachers to be effective, beneficial, appropriate, and to not have any negative side effects.
Filcheck, McNeil, Greco, and Bernard (2004) implemented a class-wide token economy in a preschool classroom in order to compare its effectiveness with that of a parent-training technique. The token reinforcement system, called the Level System, involved a chart with seven levels of behavior. Each of the 17 children in the classroom had a special marker on the chart which was moved to a higher level contingent on appropriate behavior or to a lower level when inappropriate behavior occurred. Rewards were given at the end of activity periods if the child’s marker was in a positive level. The results indicated that the Level System was effective in decreasing levels of problem behaviors class-wide and resulted in a more positive classroom environment (e.g., increased teacher praise). While these results are encouraging, one issue that should be noted is low levels of treatment integrity, such that integrity of teacher implementation fell below 80% several times over the course of the intervention. Thus, it could be argued that results may have been even more robust if integrity levels would have been higher.

Another investigation of a token economy on a class-wide level was conducted by Reitman, Murphy, Hupp, and O’Callaghan (2004). A token economy was implemented in a Head Start classroom with 17 children, three of whom had been identified as exhibiting disruptive behavior in the classroom, with inflated scores on the Oppositional and Hyperactivity subscales of the Conners Teacher Rating Scale- Revised: Short Form (CTRS-R:S; Conners, 1997). The authors devised both a class-wide and an individualized token economy to compare the effects of each variation. The three boys served as the participants for the individualized token economies in the study, while their 14 peers in the classroom served as participants for the class-wide token economy. Both
the individual and group contingencies decreased disruptive behaviors in the classroom. For the three target children, the individualized contingency was slightly more effective at decreasing their problem behaviors. Specifically, all three boys’ disruptive behaviors decreased from approximately 13% of observed intervals (range = 5-30%) in baseline phases to between 1.6 and 4.6% of observed intervals under the group contingency (range = 0-18%) and between 1 and 5% for the individualized contingency (range = 0-7%). Thus, for at-risk children, an individualized contingency may be more beneficial in decreasing level and variability of occurrence of disruptive behavior.

Based on these studies, it can be concluded that the token economy is an effective intervention to improve prosocial and appropriate behaviors (Wolfe et al., 1983) as well as to decrease problem behaviors in the classroom (Filcheck et al., 2004; McGoey & DuPaul, 2000; Reitman et al., 2004). Token economies have been used successfully in residential facilities, correctional facilities, schools (Kazdin & Bootzin, 1972; O’Leary & Drabman, 1971) and preschool settings (Filcheck et al., 2004; Reitman et al., 2004; Wolfe et al., 1983). Because this intervention has demonstrated effectiveness across multiple populations and settings, it serves as an appropriate choice for comparison with other treatments. Also, the flexible nature of the token economy lends itself to easy implementation and use within the classroom setting.

Intervention selection is guided by several considerations. One such consideration is overall effectiveness of the intervention, yet in an age of scarce resources, time requirements must also be taken into account. Interventions based on functional assessment information have been shown to address problem behaviors across many behavioral topographies, participant demographics, and settings. However,
developing an individualized intervention based on a functional assessment is more time consuming than choosing an evidence-based practice, such as the token economy. Though much research emphasizes the need for intervention comparisons, there is a lack of direct comparisons between function-based interventions and non-function based interventions. Those studies that do make a comparison between a function-based intervention and a non-function based intervention often create an unfair and unbalanced comparison by designing a function-based intervention that is inherently more comprehensive, and thus, likely more effective.

Purpose

The purpose of the current study was to directly compare an intervention based on information gained through functional assessment to an evidence-based practice, the token economy, to decrease problem behaviors while increasing appropriate behaviors in preschool children. By directly comparing these two treatment options, a better understanding of the treatment utility of functional assessment can be gained. This information is critical to inform proper treatment selection and appropriate service delivery in an age where resources and time must be conserved.

Research Questions

The following research questions were evaluated:

1. Are there differences in occurrences of appropriate behavior when a function-based intervention is used versus a non-function-based token economy?
2. Are there differences in occurrences of problem behavior when a function-based intervention is used versus a non-function-based token economy?
CHAPTER III

METHOD

Participants and Settings

The participants for the study were three preschool-aged children. The children were identified through teacher referral for problem behavior in the classroom. Participants were included in the study based on the following criteria: (a) child was enrolled in a preschool program, (b) parent/guardian and teacher gave consent for participation, and (c) child’s problem behavior occurred frequently (i.e., multiple times per day) and was observable. Participants were excluded from the study for the following reasons: (a) the child’s behavior was found to be maintained by access to tangibles, (b) there was an intervention currently in place to address the child’s problem behavior, or (c) the child’s behavior did not occur for at least 20% of observed intervals during the screening observation. Children who did not meet screening criteria received services outside the context of this study. Approval from The University of Southern Mississippi’s Institutional Review Board was obtained prior to beginning the study (See Appendix O).

All observations and data collection sessions took place in each participant’s classroom during routine classroom activities in a rural, southeastern state. The exact instructional setting during which observations occurred was determined individually, dependent on information gathered during the teacher interview regarding which setting was most problematic. Specifically, for Melvin and Elvin, observations of functional analyses and intervention conditions took place during small group direct instruction. Small group instruction included teacher-directed activities such as writing letters, cutting
out shapes, and coloring. For Adrian, observations of all functional analysis conditions and intervention conditions took place during large group morning instruction. Large group morning instruction involved teacher-led direct instruction on early literacy and numeracy skills in which the children repeated information presented by the teacher (e.g., numbers, shapes, letters) or answered teacher-presented questions (e.g., What day is today?).

**Melvin**

Melvin was a 4-year-old African American male enrolled in a pre-kindergarten classroom at a public elementary school. There were 20 children in the classroom, divided into four instructional groups with five students in each group. There was one classroom teacher and one assistant teacher. Melvin, and his identical twin brother, Elvin (described below) were placed in separate instructional groups. Melvin was referred for services due to frequent inappropriate vocalizations during small group instructional time. He did not have any diagnoses prior to the study and had not received any behavioral interventions based on FBA procedures. Melvin’s teacher indicated that his problem behavior was frequent, unmanageable, and very disruptive.

**Elvin**

Elvin was a 4-year-old African American male who was enrolled in a pre-kindergarten classroom at a public elementary school. There were 20 children in the classroom, divided into four instructional groups with five students in each group. There was one classroom teacher and one assistant teacher. Elvin and his identical twin brother, Melvin, were placed in separate instructional groups. Elvin was referred for services due to frequent inappropriate vocalizations during small group instructional time. Elvin did
not have any diagnoses prior to the study and had not received any behavioral interventions based on FBA procedures. Elvin’s teacher indicated that his problem behavior was frequent, unmanageable, and very disruptive.

Melvin and Elvin’s teacher, Ms. Tate, was a 38-year-old African-American female. She had five years of teaching experience and had been at the current school for one year. Ms. Tate was certified in both Preschool and Kindergarten education and held a Bachelor’s Degree in Child Development. She had also completed all coursework towards a Master’s Degree in Special Education. Ms. Tate used a behavior chart as a class-wide behavior management system; however, it appeared to be inconsistently used, such that the children’s markers were never moved despite occurrences of disruptive behavior. Ms. Tate was asked to discontinue implementation of this system during the intervention phase of the study.

Adrian

Adrian was a 5-year-old African-American male enrolled in Head Start. There were 18 students in Adrian’s classroom with one teacher and one assistant teacher. Adrian was referred due to frequent inappropriate vocalizations during large group instruction. Adrian had no diagnoses at the time of the study. An FBA was previously conducted for Adrian; however, no intervention was in place to address his problem behavior at the time of the study. Adrian’s teacher indicated that his inappropriate vocalizations were unmanageable, very disruptive, and occurred very frequently.

The classroom teacher, Ms. Sims, was a 52-year-old African-American female with 14 years of teaching experience, all within the Head Start program. She held an Associate’s Degree and was in the process of completing a certification program in Early
Childhood Development. There was no class-wide behavior management system in place prior to the intervention.

Materials

*Functional Assessment Informant Record for Teachers- Pre-School Version*

The Functional Assessment Informant Record for Teachers- Pre-School Version (FAIR-T P; Dufrene et al., 2007) was used in a semi-structured interview format as an initial source of information. The FAIR-T P is an adaptation of the Functional Assessment Informant Record for Teachers for use with the preschool population (Edwards, 2002; see Appendix A for complete protocol). The FAIR-T P is divided into four sections: Child Information, Problem Behaviors, Antecedents and Consequences. The first section pertains to the child’s demographics, background (e.g., developmental, medical, academic), compliance, and work completion. In the Problem Behaviors section, the child’s teacher is asked to identify one to three problem behavior(s) and to rank them in order of severity. For each problem behavior, the teacher answers questions regarding frequency, duration, severity, and topography of the behavior, as well as environmental situations that are likely to affect occurrence of the problem behavior. In the Antecedents section, the teacher is presented with a checklist of 16 possible antecedent events that may increase or decrease the likelihood of the behavior occurring, such as a difficult task, the presence of a certain person, or the child being asked to stop a certain activity. Finally, in the Consequences section, the teacher is presented with a list of possible consequent events that may occur after a behavior is exhibited, along with several questions regarding other consequences that may be in place within the classroom. For both the Antecedents and Consequences sections, the teacher answers the
section for each identified problem behavior. The information gained through the teacher interview will be used to identify each participant’s problem behavior as well as to hypothesize possible maintaining variables for problem behavior(s). Previous, albeit limited research, has indicated that the FAIR-T P is useful for identifying problem behaviors in preschool settings, produces functional hypotheses that are consistent with descriptive and experimental methods, and is linked to effective classroom intervention (Dufrene et al., 2007; LeGray, Dufrene, Sterling-Turner, Olmi, & Bellone, 2010; Poole, 2009).

*Intervention Rating Profile-15 (IRP-15)*

A modified Intervention Rating Profile-15 (IRP-15; Martens, Witt, Elliott, & Darveux, 1985) was used to determine teacher acceptability of each of the intervention procedures used in this study (See Appendix N). The IRP-15 consists of 15 questions with Likert-style ratings that range from *Strongly Disagree* (1) to *Strongly Agree* (6). Ratings on the IRP-15 range from a total score of 15 to a score of 90, with lower scores indicating less acceptability by the rater. A total score above 52.5 represents an “acceptable” rating (Von Brock & Elliott, 1987). The IRP-15 has been established as a reliable instrument (Cronbach alpha = .98) (Martens et al., 1985). This study included an adapted version of the IRP-15. Specifically, future tense items were changed to past tense. Previous research has indicated that such modifications do not negatively impact psychometric properties of the IRP-15 (Freer & Watson, 1999).

**Dependent Measures**

The study had two primary dependent measures. For each participant, both occurrence of the problem behavior and occurrence of an appropriate replacement
behavior were defined and measured across conditions. Across all three participants, inappropriate vocalization was identified as the primary target behavior by the classroom teachers during the teacher interviews. *Inappropriate vocalization* was defined as any verbal sound or utterance (e.g., talking, yelling, humming) that was irrelevant to the academic task or teacher-issued instructions or occurred at an inappropriate time. As a replacement behavior, *appropriate engagement* was defined as the student’s body oriented towards task or teacher with eyes on academic materials or looking at the teacher, and student responding to academic demands when individually requested or whole-group requested (i.e., verbal response or gestural response). Operational definitions of the target behavior and the replacement behavior were formed based on information gathered during the teacher interviews and screening observations of the children.

A 10 s partial-interval recording scheme was used for all observation sessions and was chosen based on the topography of the dependent measures. An MP3 player and headphones were used to cue the observers to record the occurrence of the dependent measures every 10 s. All sessions were conducted within each child’s classroom and were 10 min in length.

**Design and Data Analysis**

A brief functional analysis was used to evaluate the occurrence of problem behavior under various conditions corresponding to the possible functions of behavior. The brief functional analysis included a brief multi-element design with a contingency reversal at the end, modeled after the design used in Boyajian et al. (2001).
An Alternating Treatments Design (ATD) was used to evaluate the differential effects of the function-based intervention to the non-function-based token economy. An ATD is a design that can be used to compare multiple treatments effectively in single-case research (Barlow & Hayes, 1979). Based on the nature of the proposed interventions, an ATD was an advantageous choice for the study. Advantages of using an ATD include rapid alternation of treatment conditions and application of treatments within a close temporal period, which address several concerns of internal validity. Two experimental conditions (token economy, function-based intervention) and a control condition were manipulated in a semi-random fashion. The conditions were semi-random in that the decision of which condition was used each day was drawn from a slip of paper; however, no single condition was used more than two times consecutively. If a condition was chosen for the third consecutive day, that condition was set aside and another condition from the remaining two was drawn. The semi-random order served as a counterbalancing measure and helped to minimize sequencing effects (Hayes, Barlow, & Nelson-Gray, 1999). Also, the inclusion of a control condition served as another method of measuring treatment effects. Only one condition was presented per session to minimize the concern of multiple treatment interference, a major concern of the ATD. Another procedural control for multiple treatment interference is to conduct an independent verification phase with the treatment that demonstrated the greatest effect on behavior following the ATD (Barlow & Hayes, 1979). Thus, an independent verification was conducted after the ATD to assess whether the interaction of the two treatments affected occurrence of behavior. Data were represented graphically to allow for visual inspection. Visual analysis was conducted and data were evaluated based on changes in
level, trend, and variability around level and trend across series. The primary demonstration of effects across series was determined by inspecting divergence across conditions.

Procedures

Teacher Interview

After teacher referral, the FAIR-T P was conducted with the teacher in a semi-structured interview format in order to gain preliminary information regarding the participant’s problem behavior. Based on the information provided in the teacher interview, operational definitions of the target problem behavior and an appropriate replacement behavior were developed for each participant. Teacher interviews were conducted outside of regular class time, in a quiet location with limited distractions, and lasted approximately 30 min per interview.

Screening Session

Following the teacher interview, one 10 min screening observation was conducted for each participant to ensure that the problem behavior occurred at a sufficient level to allow for determination of treatment effects. During the screening, the problem behavior had to occur in at least 20% of intervals for the participant to be included. Occurrence of the target problem behavior and the appropriate replacement behavior were recorded. Over the course of the study, only one possible participant did not meet the screening criterion. Therefore, that child received services outside the context of the study.

Brief Functional Analysis

For each participant, a brief experimental analysis was conducted in order to assess the consequent event that was most likely maintaining the problem behavior and to
confirm information provided from the FAIR-T P. The experimental analysis was conducted by the primary experimenter in the participant’s classroom. Data were recorded across functional conditions to determine how each condition affected occurrence of the problem behavior and to identify which condition produced the highest level of problem behavior, which was considered the maintaining function of the behavior. The procedures for the brief functional analysis were adapted from those used by Boyajian et al. (2001) in their classroom-based functional analysis.

Four conditions were manipulated in the functional analysis, three conditions corresponding to consequent events that may serve as a function of behavior plus a control condition. By manipulating these events, a hypothesis statement could be made as to the maintaining function of the problem behavior, which could then be used to inform intervention development. The four functional conditions were access to tangibles, access to attention, escape from task demands, and a free play condition, which served as a control. The order of conditions for each child was decided randomly based on a drawing. Each condition name was written on a piece of paper and drawn from the group of four pieces of paper. The order in which the names were drawn (i.e., 1-4) determined the order of conditions and each condition was tested on a separate day. During the functional analysis conditions, the primary researcher delivered the specified reinforcer.

Following implementation of the four functional analysis conditions, a contingency reversal phase was conducted for two of the participants (i.e., Melvin and Elvin). In the contingency reversal phase, the consequence (i.e., access to attention, access to tangible, escape from task demand) that followed inappropriate behavior during
the functional analysis was presented following the occurrence of appropriate behavior. By reversing the contingency, the functional relationship between the target behavior and consequent event can be verified. Due to undifferentiated results or lack of replication during contingency reversals, extended functional analyses were completed for all three participants to gain a clearer understanding of the function of the children’s problem behavior.

*Conditions for Brief Functional Analysis*

**Tangible condition.** Prior to the functional analysis, a brief preference assessment was conducted based on the procedures developed by Carr, Nicolson, and Higbee (2000). During the preference assessment, the child had free access to an array of eight toys and was told to choose one from the selection. After the child chose an object, the child had 10 s of interaction with the object before it was removed. The child was then asked to choose from the remaining objects until there were no objects left. Only those objects that were identified as highly preferred (i.e., picked first in the preference assessment) were used during the tangible condition to increase the probability that the tangible used in the condition was a potent reinforcer for the participant. Immediately preceding the tangible condition, the participant was given unrestricted access to a preferred item for 2 min. Once teacher instruction began, the object was removed and data collection for the condition commenced. During the condition, every occurrence of the target problem behavior resulted in the child having access to the preferred tangible for 30 s. No other consequences were provided for occurrence of the problem behavior or appropriate behavior.
*Attention condition.* Immediately prior to the attention condition, all preferred objects were removed from the participant’s possession and the primary experimenter provided attention to the participant for 2 min. Once teacher instruction began, the experimenter told the participant that she needed to work and removed all attention from the participant. Contingent upon occurrence of the target problem behavior, the experimenter provided the participant with attention in the form of three verbal reprimands (e.g., “No talking! You’re not supposed to be talking. Stop that!”). After the reprimands were delivered, the experimenter returned to work-related behavior. All other behavior was ignored and no other consequences were provided for occurrence of the problem behavior or appropriate behavior.

*Escape condition.* Once teacher instruction began, task presentation to the participants was terminated contingent upon any occurrence of the target problem behavior. The task was removed for 30 s and then re-presented to the participant. When a participant did not respond to the task demand, but also did not exhibit any problem behaviors that would result in the contingent escape, a three prompt hierarchy was used, in which a verbal command was issued first; next, a verbal command with a physical gesture; and finally, physical guidance. Upon each task being re-presented, the participant had 5 s to initiate compliance with the task. If the participant did not comply with the verbal prompt and did not engage in the target behavior, the task was re-presented verbally with a physical gesture toward something relevant to the task. If the participant still did not comply, the experimenter physically guided the participant through task completion. Praise was provided for appropriate completion of tasks. No
other consequences were provided for occurrence of the target behavior or appropriate behavior.

*Control condition.* During the control (free play) condition, the participants had unrestricted access to objects and activities prior to instruction. During teacher instruction, no demands were placed on the participant and there was no consequence for occurrence of the target problem behavior (i.e., the target behavior was ignored) or appropriate behavior. Intermittent non-contingent attention was delivered to the participant every 30 s (Iwata et al., 1982). Non-contingent attention included neutral statements that are contextually relevant made to the participant, such as “I’m reading a magazine.”

*Contingency reversal phase.* During the contingency reversal, differential reinforcement of other behavior (DRO) occurred. The consequence that produced the highest levels of behavior during the brief functional analysis was re-presented; however, instead of being presented as the consequence for the target problem behavior, it was presented for the absence of the problem behavior and withheld for occurrence of the problem behavior. Opportunity for reinforcement occurred every 30 s. The graphing procedure used was a BAB reversal design, in which Condition B represents the contingency reversal and Condition A represents the original contingency of the consequence following inappropriate behavior.

*Conditions for Treatment Evaluation*

*Function-based intervention.* Following the brief functional analysis, an intervention was developed based on the identified function of the participant’s problem behavior (e.g., access to attention). The function-based intervention involved a
component intended to decrease the target problem behavior and provide a functionally-equivalent appropriate behavioral response to replace the problem behavior. An extinction procedure was used in which a response for the target problem behavior was withheld and access to the identified reinforcer was provided contingent on occurrence of the teacher-identified replacement behavior. For all three participants, access to attention was identified as the function of the behavior. Therefore, the function-based intervention consisted of the use of positive teacher attention (i.e., praise statements) contingent on occurrence of appropriate engagement, and inappropriate vocalizations were ignored. Each participant received three praise statements (to approximate 30 s of attention) on a 30 s fixed interval schedule. Specifically, the first occurrence of appropriate engagement after a 30 s interval was reinforced. Additionally, if the child engaged in problem behavior, the interval was reset. The researcher cued the teacher using an index card when the reinforcer should be provided, and the teacher delivered three praise statements or gestures each time the cue card was presented (e.g., “I love the way you are participating, Melvin! Nice work! High five!”). In order to increase discriminability between the intervention conditions, prior to beginning data collection the teacher told the participant “If you are good today, I will tell you ‘you did a good job’.”

Non-function-based intervention. As a comparison to the function-based intervention, a non-function-based token economy was established as a second treatment condition. The token economy was developed based on procedures used in McGoey and DuPaul (2000). Each participant had a chart on which stickers were placed contingent on occurrence of the appropriate replacement behavior using a differential reinforcement of alternative behavior (DRA) procedure. Additionally, if problem behavior occurred, the
interval was reset. Therefore, the first occurrence of appropriate engagement following a 30 s interval in which problem behavior did not occur, a reinforcer sticker was provided. When the appropriate replacement behavior was observed by the experimenter, the teacher was cued using an index card. The teacher then provided the participant with a brief verbal statement that included minimal attention (i.e., “You get a sticker”) and a corresponding sticker was placed on the chart. If a preset criterion number of stickers was met, the child had the opportunity to pick from a “treasure box” of tangible items at the end of the session. The number of stickers required per session to access the tangible reinforcer was determined in collaboration with the teacher based on the levels of problem behavior and appropriate behavior observed during the screening observation. Specifically, the criterion was set at five stickers based on the performance observed during the screening session. By basing the criterion on the initial occurrence of behavior, the participant’s success in achieving the reinforcer was more probable. In fact, the participants never failed to earn access to the treasure box. In order to increase discriminability between conditions, prior to beginning each non-function-based condition session, participants were told “If you are good today, you will get a sticker. If you get 5 stickers, you can pick from the treasure box.”

Control condition. A control condition was included in order to provide a measure of behavior while no treatment condition was in place during the intervention phase. The control condition consisted of the teacher conducting a typical lesson or activity without any intervention. During the control condition, the teacher was told to address the participant’s problem behavior as she would under normal conditions. The primary experimenter did not interact with the participant
Interobserver Agreement, Procedural Integrity, and Treatment Integrity

Interobserver agreement (IOA) data were collected for a minimum of 33% of data collection sessions during brief functional analysis conditions and during each experimental ATD condition for each participant. IOA was calculated by dividing the total number of agreements (occurrence and nonoccurrence) by the total number of agreements plus disagreements and multiplying by 100. For Melvin, IOA was collected for 47% of sessions for the functional analysis with an average agreement of 97% (range = 92-100%) and 63% of intervention sessions with an average agreement of 95% (range = 89-98%). For Elvin, IOA was collected for 50% of functional analysis observations with an average agreement of 97% (range = 95-98%) and 60% of intervention sessions with an average agreement of 95% (range = 92-99%). For Adrian, IOA was collected for 42% of sessions during the functional analysis with an average agreement of 97% (range = 93-100%) and for 47% of sessions during intervention with an average agreement of 96% (range = 92-98%). Observers had been previously trained to a 90% agreement criterion for behavioral observations prior to assisting with this study. When an observer’s agreement with the primary observer fell below 90%, the observer was retrained in the observation procedures and operational definitions by the primary experimenter and had to once again obtain 90% agreement before the observer’s next observation was used for the study. Re-training occurred two times over the course of the study and agreement was immediately obtained following the re-training session.

Procedural integrity data were collected for all functional analysis sessions to ensure that the researcher adhered to the protocols for each functional condition (see Appendices B-I for protocols). A checklist with all functional analysis procedures was
used to assess procedural integrity, which was reported as percentage of steps completed accurately. Average procedural integrity for Melvin was 100%, and integrity only dropped below 100% during one session, for which integrity was 94%. For Elvin, average procedural integrity was 99% and only fell below 100% for 2 sessions, which were 90% and 94% integrity. For Adrian, procedural integrity averaged 99.5% and only dropped below 100% for one session, during which integrity was assessed as 94%. IOA on procedural integrity was collected for 33% of observations for Melvin with an average of 99% (range = 94-100%), 38% of observations for Elvin with an average of 100%, and 42% of observations for Adrian with an average of 98% (range = 90-100%).

Treatment integrity data were gathered during all intervention sessions with the aid of a checklist to ensure that the interventions were implemented appropriately by the classroom teachers (see Appendices J and K for protocols). Treatment integrity was collected for a minimum of 25% of observations during intervention conditions, and interrater agreement on treatment integrity was collected for a minimum of 33% of those observations. Treatment integrity scores were reported as the percentage of treatment steps on the checklist completed accurately. Average treatment integrity for Melvin was 100%, for Elvin, 98% (range = 83-100%), and for Adrian, 98.6% (range = 83-100%). IOA on treatment integrity for Melvin was collected for 59% of observations and averaged 98.3% (range = 83-100%) and for Elvin, IOA was collected for 50% of observation sessions and averaged 98.5% (range = 83-100%). Finally, for Adrian, IOA on treatment integrity was collected for 50% of sessions and averaged 96.6% (range = 83-100%).
CHAPTER IV
RESULTS

Functional Analysis

*Melvin*

During the FAIR-T P interview, the teacher indicated that Melvin engaged in frequent inappropriate vocalizations that resulted in Melvin escaping task demands (i.e., teacher removing work from his desk or removing him from the group), as well as accessing peer attention and teacher attention in the form of reprimands, redirections, and interruptions. Results obtained from the functional analysis for Melvin are shown in Figure 1. During the free play (control) condition, Melvin's inappropriate vocalizations occurred in 12% of the observed intervals. During the attention condition, Melvin’s inappropriate vocalizations occurred in 40% of the observed intervals. During the tangible condition, Melvin’s inappropriate vocalizations occurred in 72% of the observed intervals. However, during the tangible condition, Melvin ran around the table laughing and screaming with the tangible object, gaining access to attention from both the teacher and peers. During the escape condition, Melvin’s inappropriate vocalization occurred in 43% of the observed intervals. To determine whether access to a tangible item was the maintaining function of Melvin’s inappropriate vocalizations, a contingency reversal was implemented. During the contingency reversal, Melvin engaged in inappropriate vocalizations during 47% of the observed intervals, comparable to the levels of behavior previously observed under the escape and attention conditions.

Due to the undifferentiated results, an extended analysis of the three experimental functions was conducted. During the extended analysis, Melvin engaged in inappropriate
vocalization during an average of 61% of observed intervals (range = 48-70%) under the attention condition. For the escape condition in the extended analysis, Melvin engaged in inappropriate vocalizations during an average of 31.5% of the intervals (range = 25-38%). Finally, for the tangible condition in the extended analysis, Melvin engaged in inappropriate vocalizations an average of 23% of observed intervals (range = 10-42%). Based on the results of the extended analysis, it was determined that Melvin’s behavior was maintained by access to attention.

![Extended Analyses](image)

*Figure 1.* The results of Melvin’s functional analysis.

*Elvin*

During the FAIR-T P interview, the teacher indicated that Elvin engaged in inappropriate vocalizations that often resulted in Elvin accessing attention from his peers and teacher in the form of interruptions and reprimands. Results obtained from the functional analysis for Elvin are shown in Figure 2. During the free play (control) condition, Elvin's inappropriate vocalizations occurred in 23% of the observed intervals.
During the attention condition, Elvin’s inappropriate vocalizations occurred in 71% of the observed intervals. During the tangible condition, Elvin’s inappropriate vocalizations occurred in 42% of the observed intervals. During the escape condition, Elvin’s inappropriate vocalizations occurred in 48% of the observed intervals. To further demonstrate the functional relationship between access to attention and occurrence of inappropriate vocalizations, a contingency reversal was implemented. During the initial contingency reversal, Elvin engaged in inappropriate vocalizations during 45% of observed conditions. When attention was contingent on inappropriate vocalization, the problem behavior occurred in 47% of observed intervals. During the final contingency reversal, inappropriate vocalization occurred in 30% of observed intervals.

Due to the failure of the contingency reversal phase in validating results from the brief functional analysis, an extended analysis of the two functions which resulted in the highest level of target behavior occurrence (i.e., escape and attention) was conducted. During the extended analysis, Elvin engaged in inappropriate vocalization during an average of 45.75 % of observed intervals (range = 33-57%) under the attention condition. For the escape condition in the extended analysis, Elvin engaged in inappropriate vocalizations an average of 30.2% (range = 8-58%) of observed intervals. Based on the results of the extended analysis, it was determined that Elvin’s behavior was maintained by access to attention.
Adrian

During the FAIR-T P interview, the teacher indicated that Adrian engaged in frequent inappropriate vocalizations that resulted in Adrian escaping task demands (i.e., teacher removed worksheets from desk or stopped presented academic material to him) and accessing peer attention and teacher attention in the form of redirections, interruptions, and reprimands. Results obtained from the functional analysis for Adrian are shown in Figure 3. During the free play (control) condition, Adrian’s inappropriate vocalizations occurred in 10% of the observed intervals. During the attention condition, Adrian’s inappropriate vocalizations occurred in 23% of the observed intervals. During the tangible condition, Adrian’s inappropriate vocalizations occurred in 25% of the observed intervals. During the escape condition, Adrian’s inappropriate vocalization occurred in 33% of the observed intervals. Due to the undifferentiated results of the brief

Figure 2. The results of Elvin’s functional analysis.
functional analysis, an extended analysis of the three possible functions was conducted. During the extended analysis, Adrian engaged in inappropriate vocalization during an average of 53.67% of observed intervals (range = 43-63%) under the attention condition. For the tangible condition in the extended analysis, Adrian engaged in inappropriate vocalizations during an average of 25% of observed intervals (range = 8-42%). Finally, under the escape condition, Adrian engaged in inappropriate vocalization during an average of 13.5% of observed intervals (range = 12-15%). Based on the results of the extended analysis, it was determined that Adrian’s behavior was maintained by access to attention.

Figure 3. The results of Adrian’s functional analysis.
Intervention

Melvin

The data for Melvin’s appropriate engagement are found in Figure 4. During the control condition, appropriate engagement averaged 56% of observed intervals (range = 40-73%). While the initial level of Melvin's appropriate engagement during the control condition was 73%, over the course of the next two control sessions a decrease in level was observed. Melvin's appropriate engagement under the function-based intervention averaged 81.6% during the observed intervals (range = 67-100%). While slightly variable, the data demonstrate higher levels under the function-based intervention condition. Melvin’s appropriate engagement under the non-function-based intervention averaged 62.75% of observed intervals (range = 40-80%). Based on the observed levels, it was determined that the function-based intervention was more effective for increasing Melvin’s level of appropriate engagement. In order to determine the effectiveness of the function-based intervention in isolation, a verification phase was conducted. During the verification phase, Melvin’s appropriate engagement averaged 84.3% of the observed intervals (range = 78-93%). After an initial increase, a slight decrease occurred. However, appropriate engagement remained stable for the duration of the phase.
Figure 4. Melvin’s level of appropriate engagement, measured as percent of intervals in which the behavior occurred across observations and conditions. The first panel represents the comparison of two treatment conditions plus a control condition. In the second panel, the function-based intervention was presented in isolation for the verification phase.

The data for Melvin’s inappropriate vocalizations are found in Figure 5. It should be noted that for Melvin, the data for appropriate engagement served as the determinant of changing phases. Even so, the data for inappropriate vocalizations show a treatment effect. During the control condition, inappropriate vocalization averaged 21.67% of observed intervals (range = 15-28%). Melvin’s inappropriate vocalizations under the function-based intervention averaged 22% during the observed intervals (range = 10-43%), and were highly variable. Melvin’s inappropriate vocalization under the non-function-based intervention averaged 30.75% of observed intervals (range = 25-38%). The data under the non-function-based condition were relatively stable for the duration of the condition. In order to determine the effectiveness of the function-based intervention in isolation, a verification phase was conducted. During the verification phase, Melvin’s inappropriate vocalization averaged 14.43% (range = 7-27%). Upon conducting the
function-based intervention in isolation, a decrease in variability was evident, and the data remained stable for the duration of the phase.

![Graph](image)

*Figure 5.* Melvin’s level of inappropriate vocalizations, measured as percent of intervals in which the behavior occurred across observations and conditions. The first panel represents the comparison of the two treatment conditions plus the control condition. The second panel demonstrates the function-based intervention presented in isolation for the verification phase.

*Elvin*

The data for Elvin’s appropriate engagement are found in Figure 6. During the control condition, appropriate engagement averaged 43.25% of observed intervals (range = 32-58%) and was relatively stable. Elvin's appropriate engagement under the function-based intervention averaged 74.83% during the observed intervals (range = 62-85%). Elvin’s appropriate engagement under the non-function-based intervention averaged 84.5% of observed intervals (range = 72-97%). Based on the observed levels of behavior, treatment effects were observed for both the function-based and non-function-based intervention. Because there were no overlapping data points between the
intervention conditions and the control condition, the two experimental conditions were continued in an extended analysis. However, the interventions remained equally effective, with appropriate engagement averaging 78.67% of observed intervals for the non-function based intervention and 69.33% for the function-based intervention. Furthermore, five out of six data points overlapped between the conditions. Because the interventions were found to be equally effective in increasing Elvin’s level of appropriate engagement, his teacher was asked to choose the treatment that she wanted to continue using. She stated that she considered the sticker chart more effective. Thus, the teacher’s choice, the non-function-based intervention, was conducted in isolation for the verification phase. During the verification phase, Elvin’s appropriate engagement averaged 69.75% (range = 55-92%), with a steep increasing trend. By allowing the teacher to choose which intervention to use out of two equally effective interventions, a socially valid intervention decision was made. Some research supports the importance of social validity (e.g., allowing the change agent to choose the intervention that will be used) in treatment decisions (Gresham & Lopez, 1996).
Figure 6. Elvin’s level of appropriate engagement, measured as percent of intervals in which the behavior occurred across observations and conditions. The first panel represents comparison of the two treatment conditions plus a control condition. In the second panel, the comparison of only the two treatment conditions is presented. The third panel shows the verification phase with only the non-function-based intervention.

The data for Elvin’s inappropriate vocalization are found in Figure 7. During the control condition, inappropriate vocalization averaged 33% of observed intervals (range = 10-73%), with large variability. Elvin's inappropriate vocalization under the function-based intervention averaged 21.5% during the observed intervals (range = 10-30%). Elvin’s inappropriate vocalization under the non-function-based intervention averaged 28.5% of observed intervals (range = 8-43%). All three conditions were variable, with little treatment effects able to be determined regarding inappropriate vocalizations. A phase change decision was made based on the appropriate engagement data. When only the two experimental conditions were implemented, an immediate change in level and decrease in variability was observed. For the non-function-based intervention, Elvin
inappropriately vocalized in 7.3% of observed intervals on average (range = 7-8%). Under the function-based intervention, Elvin’s inappropriate vocalization was observed in 7.67% of intervals on average (range = 3-12%). As with appropriate engagement, the treatments continued to show equal effectiveness in decreasing the level of Elvin’s inappropriate vocalization, with four of six data points overlapping. During the verification phase, the non-function-based intervention was presented in isolation (as per the teacher’s decision). Elvin’s inappropriate vocalization averaged 14.25% (range = 10-23%) of observed intervals.

Figure 7. Elvin’s level of inappropriate vocalizations, measured as percent of intervals in which the behavior occurred across observations and conditions. The first panel represents comparison of the two treatment conditions plus a control condition. In the second panel, the comparison of only the two treatment conditions is presented. The third panel shows the verification phase with only the non-function-based intervention.
Adrian

The data for Adrian’s appropriate engagement are found in Figure 8. During the control condition, appropriate engagement averaged 19.67% of observed intervals (range = 2-30%). The control condition resulted in relatively stable and low levels of appropriate engagement. Adrian’s appropriate engagement under the function-based intervention averaged 81% during the observed intervals (range = 72-87%) and remained relatively stable throughout the alternations of treatments. Adrian’s appropriate engagement under the non-function-based intervention averaged 56.67% of observed intervals (range = 45-70%). To measure treatment effects of the most effective intervention in isolation, a verification phase was conducted with the function-based intervention. During the verification phase, Adrian’s appropriate engagement averaged 88.2% (range = 85-98%), with a stable level of performance.

*Figure 8.* Adrian’s level of appropriate engagement, measured in percent of intervals in which the behavior occurred across observations and conditions. The first panel represents comparison of the two treatment conditions plus a control condition. The second panel shows the function-based intervention condition in isolation for the verification phase.
The data for Adrian’s inappropriate vocalization are found in Figure 9. During the control condition, inappropriate vocalization averaged 46% of observed intervals (range = 35-60%). Adrian’s inappropriate vocalization under the function-based intervention averaged 20.75% during the observed intervals (range = 15-28%). Adrian’s inappropriate vocalization under the non-function-based intervention averaged 31% of observed intervals (range = 27-38%). During the verification phase, the function-based intervention was presented in isolation. Adrian’s inappropriate vocalization averaged 9.8% (range = 3-17%) of observed intervals.

*Figure 9.* Adrian’s level of inappropriate vocalizations, measured in percent of intervals in which the behavior occurred across observations and conditions. The first panel represents comparison of the two treatment conditions plus a control condition. The second panel shows the function-based intervention condition in isolation for the verification phase.
Acceptability

Each teacher completed the IRP-15 within the first week following the end of data collection sessions for both intervention procedures (i.e., function-based and non-function-based). According to the rating profiles, the results were mixed. Melvin and Elvin’s teacher, Ms. Tate, found both interventions to be acceptable, beneficial, and appropriate with no negative consequences. Ms. Tate completed separate profiles for each participant. Regarding Melvin, she reported a total score of 69 for the non-function-based intervention and 75 for the function-based intervention. For Elvin, Ms. Tate reported a total score of 85 for the non-function-based procedure and 82 for the function-based intervention. Adrian’s teacher, Ms. Sims, rated the function-based intervention as unacceptable (46) and the non-function-based intervention as highly acceptable (76). A reported total score above 52.5 demonstrates an “acceptable” rating (Von Brock & Elliott, 1987).
CHAPTER V
DISCUSSION

The current study empirically compared the effectiveness of function-based interventions, to non-function-based interventions, derived from common evidence-based classroom practices. For the function-based intervention, DRA on an interval schedule was used in which the participant gained access to attention contingent on the first occurrence of appropriate behavior after a 30 s interval. A token economy including a sticker chart served as the non-function-based intervention in which participants gained access to a treasure box contingent on meeting a preset criterion number of stickers for appropriate engagement. The effects of each intervention were measured regarding their impact on level of occurrence of problem behavior, as well as an appropriate replacement behavior in three preschool children. In conducting a direct comparison of these two treatment options, the treatment utility of functional assessment procedures was investigated. This information can be directly used in treatment development and selection. Specifically, by understanding the most effective methods by which to select the most appropriate interventions, service delivery and resources can be maximized.

Research Question 1

When considering the first research question, whether differences in occurrence of an appropriate replacement behavior (i.e., appropriate engagement) were dependent on the type of intervention (i.e., function-based or non-function-based), the results are mixed. For two of the participants (i.e., Melvin and Adrian), the function-based intervention was clearly more effective in increasing the level of appropriate engagement based on visual analysis of divergence between conditions. However, for Elvin, the
interventions were equally effective, with the non-function-based intervention resulting in a slightly higher mean percentage of intervals during which Elvin was appropriately engaged.

Research Question 2

When considering the second research question, whether differences in occurrence of problem behavior were dependent on the type of intervention (i.e., function-based or non-function-based), the results demonstrated slight superiority of the function-based intervention to decrease levels of problem behavior. For all three participants, the function-based intervention resulted in lower mean levels of the identified target behavior, inappropriate vocalizations. These results should be viewed cautiously, however. For several of the participants, the data were variable and often the ranges of occurrence overlapped between intervention conditions.

The results of the current study are consistent with previous research demonstrating that function-based interventions may be more effective than non-function based interventions (Ellingson et al., 2000; Ingram et al., 2005; Newcomer & Lewis, 2004). However, one important unique contribution of the current study is the use of a direct comparison between the function-based intervention and the non-function-based intervention that is more valid than those conducted in the past. The comparisons made in previous research have often been unbalanced, such that the function-based intervention was either more comprehensive or included more components than a single-component, non-function-based procedure that was used (Ellingson et al., 2000; Ingram et al., 2005; Newcomer & Lewis, 2004). Comparing interventions in this way may have inherently increased the likelihood of the function-based procedure appearing superior,
due to lack of an appropriate comparison rather than a truly superior intervention approach. By including an evidence-based practice (i.e., token economy) as the non-function-based intervention, a more fair comparison has been made, and the utility of function-based interventions can be more appropriately discerned. Based on these results, the utility of conducting a functional assessment as part of the process of intervention development has been demonstrated in that the function-based intervention was more effective in improving the classroom behavior for two of the three participants.

Another aspect of the study that should be noted is the use of brief functional analyses. The obtained results support previous findings that occasionally brief functional analyses result in undifferentiated functions, and an extended analysis must be completed in order to fully understand the functional relationship (Kahng & Iwata, 1999). Future research should evaluate the conditions under which brief functional analyses are more or less likely to result in undifferentiated results. Furthermore, the use of functional analysis procedures in a preschool classroom with typically developing children adds to the relatively limited literature of these procedures being used in traditional educational facilities with individuals without disabilities (Boyajian et al., 2001; Dufrene et al., 2007; VanDerHeyden et al., 2001). Similarly, the use of DRA procedures in typically-developing preschool children adds to the literature base on differential schedules of reinforcement as effective behavioral techniques. The majority of previous research on DRA has been conducted with individuals with disabilities. Thus, the effective use of DRA as a function-based intervention for three preschool children without disabilities in traditional educational settings broadens the scope of utility and supports previous findings involving DRA.
Finally, the current study assessed acceptability of the intervention procedures used. Teachers independently rated the acceptability of the function-based intervention and non-function-based token economy separately. The ratings obtained from the participating teachers were mixed. For one teacher, Ms. Tate, both procedures were rated as very acceptable. Furthermore, she rated the procedure that was more effective, or perceived to be more effective, as more acceptable. However, for Ms. Sims, the function-based intervention was rated as unacceptable, while the non-function-based intervention was rated as highly acceptable.

The finding that Ms. Sims rated the function-based intervention as substantially less acceptable than the non-function-based intervention is surprising, especially when considering that the function-based intervention was substantially more effective in improving Adrian’s appropriate engagement and decreasing his inappropriate behavior. Her ratings also contradict previous literature that suggests that interventions that are simple are often rated more acceptable than more complex, multi-component interventions (Gresham & Lopez, 1996). For the function-based intervention, the only component was positive attention in the form of praise. The non-function-based intervention required use of a sticker chart and treasure box, which is more complex and requires more resources. Therefore, there are several possible explanations for why this rating occurred. Gresham and Lopez (1996) suggest that more experienced teachers rate all procedures as less acceptable than less experienced teachers. Also, teachers with more education generally rate behavioral interventions as more acceptable than teachers with less knowledge (Gresham & Lopez, 1996). The demographics of the two participating teachers can be used to support some of these previous findings in that Ms.
Tate was a less experienced teacher with a higher level of education than Ms. Sims, who was a more experienced teacher but had attained a lower level of education. Furthermore, as is the case in the current study, acceptability ratings do not necessarily reflect effectiveness. Specifically, teachers may reject certain treatment options because they lack the skill to implement them and may be philosophically opposed to the intervention (Gresham & Lopez, 1996). Anecdotally, Ms. Sims appeared uncomfortable delivering praise and engaged in the use of positive attention for appropriate behavior extremely infrequently. Instead, she frequently engaged in the use of reprimands and negative attention. Therefore, for Ms. Sims, the ratings may represent personal preference rather than true acceptability.

Limitations

Though the results support the effectiveness of function-based interventions over non-function-based interventions to decrease problem behavior and increase appropriate engagement, several limitations should be noted. First, while function-based interventions were found to be more effective than non-function-based interventions, the only outcome measures used in support were participant treatment outcomes and teacher acceptability. Other indicators of treatment utility may provide the literature base with more information on the relative effectiveness and feasibility of these interventions. For example, future research should consider the resources required for function-based versus non-function-based interventions. Specifically, the time and monetary resources needed for each could be considered in future research on the topic.

A second limitation is that the differences in academic tasks in each of the preschool classrooms may have acted as an establishing operation for certain data
collection sessions. Specifically, some tasks naturally resulted in higher levels of teacher attention than other tasks due to the task difficulty and performance ability of the child. For example, using scissors to cut out shapes was a more difficult task that resulted in more teacher attention, as compared to an activity such as coloring. On days when the child accessed more attention due to the nature of the task, he may not have “needed” to engage in inappropriate behavior in order to gain access to attention. Thus, the natural establishing operation may have incidentally resulted in lower instances of problem behavior and higher levels of engagement for certain observation sessions. Future research may address this concern by holding the academic task constant.

A third limitation that should be considered is the undifferentiated results of the functional analyses, which necessitated the use of extended analyses. While the original research plan was to conduct a brief functional analysis, the variability and overlap in the data between the conditions resulted in an inability to clearly determine the function of the behavior. Therefore, extended analyses were conducted in order to gain a clearer demonstration of the functional relationship and guide appropriate treatment development. The need to carry out extended analyses lengthened the assessment period and delayed the onset of intervention; however, the development of effective function-based interventions warrants this practice. Future research should continue to investigate more efficient yet effective methods of conducting functional analyses.

A fourth limitation, also related to the functional analyses, is that the primary researcher conducted the analyses for all three participants. Therefore, it is unknown whether different results would have been obtained had the classroom teacher conducted the analyses. As the analyses were conducted in the child’s classroom during regular
academic tasks, having the teacher implement functional analysis conditions may have impacted her ability to deliver instruction. While some studies have begun to look at teacher-conducted functional analysis (Martens, Gertz, de Lacy Werder, & Rymanowski, 2010; Skinner, Veerkamp, Kamps, & Andra, 2009), future research should further investigate this topic.

A fifth limitation is that the primary researcher did not collect procedural integrity data for the control condition. Although a formal measure was not completed, anecdotal evidence suggests that the teachers did not engage in intervention procedures when the control condition was in place. Specifically, the sticker chart and treasure box were not physically present when the control condition occurred. Also, the teachers were never encouraged or prompted to engage in the use of praise when the control condition was in place. Therefore, the use of praise occurred infrequently and if it did naturally occur, it was not specific to the target child or replacement behavior. As a further measure of certainty that no intervention was in place during the control condition, future research should include a procedural integrity checklist.

Despite these limitations, the current study offers valuable information regarding the utility of functional assessment procedures. For two of the three participants, the use of data derived from functional analyses to guide intervention development resulted in greater reductions in the level of inappropriate classroom behavior and greater improvements in the level of appropriate classroom behavior, as compared to an evidence-based practice that was not linked to behavioral function. Even though functional assessment procedures may require slightly more time to complete, the current study suggests that this may be time well spent.
APPENDIX A

FUNCTIONAL ASSESSMENT INFORMANT RECORD FOR TEACHERS -

PRESCHOOL VERSION

If information is being provided by both the Teacher and the Classroom Aide, indicate both respondents' names. In addition, in instances where divergent information is provided, note the sources of specific information.

Student:__________________________________________________________

Respondent(s):____________________________________________________

School:____________________ Age:____ Sex: M F

Date:________

1. Describe the referred student. What is he/she like in the classroom? (Write down what you believe is the most important information about the referred student.)

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

2. Pick a second student of the same sex who is also difficult to manage. What makes the referred student more difficult than the second student?

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

3. a. Is the student’s developmental age equivalent to their chronological age?

____________________________________________________________________

b. What is your estimate of the student’s developmental age?

____________________________________________________________________

4. a. Are the student’s social skills developmentally appropriate?

____________________________________________________________________

b. Does the student’s social skills represent a behavioral excess or deficit?

____________________________________________________________________

5. a. What percentage of requests does the student comply with the first time presented? (0 - 100%)?

____________________________________________________________________
b. What percentage will they eventually comply with?
__________________________________________

c. What is the student's accuracy for compliance (0 - 100%)?

_________________________________________________________________

6. a. What is the student’s percentage of work completion (0-100%)

_________________________________________________________________

b. What is the student’s accuracy of completed work (0-100%)

_________________________________________________________________

7. Does the student receive any regular medications?
   _____ Yes   _____ No   If yes, briefly explain:

_________________________________________________________________

8. Does the student have any diagnosed medical conditions?
   _____ Yes   _____ No   If yes, briefly explain:

_________________________________________________________________

9. Please describe this student’s strengths.

_________________________________________________________________

10. What procedures have you tried in the past to deal with this student's problem behavior?

_________________________________________________________________

_________________________________________________________________

Have previous procedures been successful? Why? Why not?

_________________________________________________________________

_________________________________________________________________
11. Describe your current class-wide behavior management plan.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

12. Does the student and/or their family receive services in the home? If so, what types of services?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

13. Briefly list below the student's typical daily schedule of activities.

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. When during the day (two classroom activities and times) does the student's problem behavior(s) typically occur?

   Classroom Activity #1____________________
   Time___________________
   
   Classroom Activity #2____________________
   Time___________________

15. Please indicate good days and times to observe. (At least 2 observations are needed.)

   Observation #1    Observation #2    Observation #3
   Date_________    Date_________    Date_________
   Time_________    Time_________    Time_________
Problem Behaviors

Please list one to three problem behaviors in order of severity. Do not use a general description such as "disruptive" but give the actual behavior such as "doesn't stay in his/her seat", or "talks out without permission".

1. _____________________________________________________________________________________________
2. _____________________________________________________________________________________________
3. _____________________________________________________________________________________________

1. Rate how manageable the behavior is:
   a. Problem Behavior 1
      1 2 3 4 5
      Unmanageable  Manageable
   b. Problem Behavior 2
      1 2 3 4 5
      Unmanageable  Manageable
   c. Problem Behavior 3
      1 2 3 4 5
      Unmanageable  Manageable

2. Rate how disruptive the behavior is:
   a. Problem Behavior 1
      1 2 3 4 5
      Mildly  Very
   b. Problem Behavior 2
      1 2 3 4 5
      Mildly  Very
   c. Problem Behavior 3
      1 2 3 4 5
      Mildly  Very

3. How often does the behavior occur per day (please circle)?
   a. Problem Behavior 1
      <1-3  4-6  7-9  10-12  >13
   b. Problem Behavior 2
      <1-3  4-6  7-9  10-12  >13
   c. Problem Behavior 3
      <1-3  4-6  7-9  10-12  >13
4. How long does the behavior last?
   a. Problem Behavior 1  
      < 1 min  1-5 min  6-10 min  >10 min 
   b. Problem Behavior 2  
      < 1 min  1-5 min  6-10 min  >10 min 
   c. Problem Behavior 3  
      < 1 min  1-5 min  6-10 min  >10 min 

5. How many months has the behavior been present?
   a. Problem Behavior 1  
      <1     2     3     4     entire school year 
   b. Problem Behavior 2  
      <1     2     3     4     entire school year 
   c. Problem Behavior 3  
      <1     2     3     4     entire school year 

**Antecedents:**  Problem Behavior #_____:____________________

1. Does the behavior occur more often during a certain type of task? ___ ___
2. Does the behavior occur more often during easy tasks? ___ ___
3. Does the behavior occur more often during difficult tasks? ___ ___
4. Does the behavior occur more often during new tasks? ___ ___
5. Does the behavior occur more often when a request is made to stop an activity? ___ ___
6. Does the behavior occur more often when a request is made to begin a new activity? ___ ___
7. Does the behavior occur more often during transition periods? ___ ___
8. Does the behavior occur more often when a disruption occurs in the student's normal routine? ___ ___
9. Does the behavior occur more often when the student's request has been denied? ___ ___
11. Does the behavior occur more often with a specific person? ___ ___
12. Does the behavior occur more often when a specific person is not there? ___ ___
13. Are there any other behaviors that usually precede the problem behavior? ___ ___
14. Is there anything you could do that would ensure the occurrence of the behavior?

15. Are there any events occurring in the child's home that seem to precede occurrence of the behavior at school?

16. Does the behavior occur more often in certain settings?
   (circle all that apply)
   - large group
   - small group
   - independent work
   - one-to-one interaction
   - bathroom
   - playground
   - cafeteria
   - bus
   - other: ____________________________________________________

Antecedents: Problem Behavior #_____:

   Yes   No
1. Does the behavior occur more often during a certain type of task?
2. Does the behavior occur more often during easy tasks?
3. Does the behavior occur more often during difficult tasks?
4. Does the behavior occur more often during new tasks?
5. Does the behavior occur more often when a request is made to stop an activity?
6. Does the behavior occur more often when a request is made to begin a new activity?
7. Does the behavior occur more often during transition periods?
8. Does the behavior occur more often when a disruption occurs in the student's normal routine?
9. Does the behavior occur more often when the student's request has been denied?
10. Does the behavior occur more often with a specific person?
11. Does the behavior occur more often when a specific person is not there?
12. Are there any other behaviors that usually precede the problem behavior?
13. Is there anything you could do that would ensure the occurrence of the behavior? ____  ____

14. Are there any events occurring in the child's home that seem to precede occurrence of the behavior at school? ____  ____

15. Does the behavior occur more often in certain settings? ____  ____
   (circle all that apply)
   large group  small group  independent work  one-to-one interaction
   bathroom  playground  cafeteria  bus
   other: __________________________________________

Antecedents: Problem Behavior #____:________________________

   Yes  No

1. Does the behavior occur more often during a certain type of task? ____  ____

2. Does the behavior occur more often during easy tasks? ____  ____

3. Does the behavior occur more often during difficult tasks? ____  ____

4. Does the behavior occur more often during new tasks? ____  ____

5. Does the behavior occur more often when a request is made to stop an activity? ____  ____

6. Does the behavior occur more often when a request is made to begin a new activity? ____  ____

7. Does the behavior occur more often during transition periods? ____  ____

8. Does the behavior occur more often when a disruption occurs in the student's normal routine? ____  ____

9. Does the behavior occur more often when the student's request has been denied? ____  ____

11. Does the behavior occur more often with a specific person? ____  ____

12. Does the behavior occur more often when a specific person is not there? ____  ____

13. Are there any other behaviors that usually precede the problem behavior? ____  ____
14. Is there anything you could do that would ensure the occurrence _____ _____ of the behavior?

15. Are there any events occurring in the child's home that seem to _____ _____ precede occurrence of the behavior at school?

16. Does the behavior occur more often in certain settings? _____ _____

(circle all that apply)

large group  small group  independent work  one-to-one interaction

bathroom  playground  cafeteria  bus

other:_____________

Consequences: Problem Behavior #_____:

1. Please indicate whether the following consequences occur after the behavior is exhibited.

Consequence  Yes  No

Access to Preferred Activity     _____  _____
Termination of Task     _____  _____
Rewards     _____  _____
Peer Attention     _____  _____
Teacher Attention     _____  _____
Praise     _____  _____
Ignore     _____  _____
Re-direction     _____  _____
Interrupt     _____  _____
Reprimand     _____  _____
Corporal Punishment     _____  _____

2. Is there any task you have stopped presenting to the student as a result of the problem behavior?

_____ Yes  _____ No  If yes, describe:____________________________________

3. Are there other problem behaviors that often occur after the behavior is exhibited?
4. Does the student typically receive praise or any positive consequence when behavior occurs that you would like to see instead of the problem behavior?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Comments:_____________________________________________________

Consequences:  Problem Behavior #_____: ________________________________

1. Please indicate whether the following consequences occur after the behavior is exhibited.

<table>
<thead>
<tr>
<th>Consequence</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to Preferred Activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Termination of Task</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rewards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer Attention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Attention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Praise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Re-direction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interrupt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reprimand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corporal Punishment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Is there any task you have stopped presenting to the student as a result of the problem behavior?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

If yes, describe:____________________________

3. Are there other problem behaviors that often occur after the behavior is exhibited?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

If yes, describe:________________________________________
4. Does the student typically receive praise or any positive consequence when behavior occurs that you would like to see instead of the problem behavior?

   _____ Yes   _____ No

Comments:________________________________________________________________________

Consequences: Problem Behavior #_____:______________________________________________

1. Please indicate whether the following consequences occur after the behavior is exhibited.

<table>
<thead>
<tr>
<th>Consequence</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to Preferred Activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Termination of Task</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rewards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer Attention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Attention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Praise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Re-direction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interrupt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reprimand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corporal Punishment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Is there any task you have stopped presenting to the student as a result of the problem behavior?  _____ Yes  _____ No

   If yes, describe:__________________________________________________________________

3. Are there other problem behaviors that often occur after the behavior is exhibited?

   _____ Yes   _____ No

   If yes, describe:__________________________________________________________________

4. Does the student typically receive praise or any positive consequence when behavior occurs that you would like to see instead of the problem behavior?

   _____ Yes   _____ No
APPENDIX B

FUNCTIONAL ANALYSIS PROTOCOL

Student Name: _______________  Teacher: _______________

Session: _______________  Date: _______________

Condition: TANGIBLE

Operational Definition and Measurement of Target Behaviors

Target Behavior: To be determined based on collaboration with teacher

Definition: Will be developed based on behavioral topography

Dependent Measure: Will be determined

Data Collection Procedures and Other Behavioral Definitions

1. Target Behavior = Recording scheme will be determined based on topography

Session Duration: 10 min

Setting: Classroom

Type of activity: Group Instruction

Materials: Student’s preferred items/toys (Allow the student free access). Have all preferred items present.

Procedures:

1) Say, “[Student’s name], would you like to play with this toy?”
2) Interact with the target student for 2 minutes or until he/she is engaged with the preferred item.
3) After the child has engaged with the preferred item, take the item away and place it in the child’s view but out of her reach.
4) Seat student in designated area [Teacher will present class activity that in the past has been related to the occurrence of the target behavior].
5) Say “[Student’s Name], it’s time to listen to the teacher and join the group.”
6) The teacher will then begin the group instruction procedure.
7) Contingent on occurrence of the target behavior:
   a. Present the child with the preferred item for a period of 30 seconds
8) Do not respond to any other problem behavior.
APPENDIX C
FUNCTIONAL ANALYSIS PROTOCOL

Student Name: _______________  Teacher: ___________
Session: _______________  Date: _______________
Condition: CONTROL

Operational Definition and Measurement of Target Behaviors

Target Behavior: To be determined based on collaboration with teacher
Definition: Will be developed based on behavioral topography
Dependent Measure: Will be determined

Data Collection Procedures and Other Behavioral Definitions

1. Target Behavior = Recording scheme will be determined based on topography
Session Duration: 10 min
Setting: Classroom
Type of activity: Preferred toy play (e.g., magazines, blocks, books)
Materials: Student’s preferred materials/toys (Allow the student free access). Have all preferred items present.

Procedures:

1. Say, “[Student’s name], would you like to play with these toys?”
2. Seat student in designated area
3. Interact with the student by providing a neutral comment every 30s or by responding to each appropriate response from the student.
4. Provide descriptive praise for appropriate toy play.
5. Provide any assistance necessary using a least-to-most prompt for appropriate toy play if requested or needed.
6. Do not respond to any problem behavior.
APPENDIX D
FUNCTIONAL ANALYSIS PROTOCOL

Student Name: ___________  Teacher: ___________
Session: ___________  Date: ___________
Condition: **ATTENTION**

---

**Operational Definition and Measurement of Target Behaviors**

**Target Behavior:** To be determined based on collaboration with teacher

**Definition:** Will be developed based on behavioral topography

**Dependent Measure:** Will be determined

---

**Data Collection Procedures and Other Behavioral Definitions**

1. **Target Behavior** = Recording scheme will be determined based on topography

   **Session Duration:** 10 minutes

   **Setting:** Classroom

   **Type of activity:** Group Instruction

   **Materials:** Task related items

   **Procedures:**

   1. Seat student in designated area [*Teacher will present class activity that in the past has been related to the occurrence of the target behavior*].

   2. Say “[Student’s Name], it’s time to listen to the teacher and join the group.”

   3. Divert your attention from the student to your paper work.

   4. Contingent on each occurrence of target behavior:

      - Provide a disapproving comment (or specific type of attention identified in the descriptive analysis)

      - Interact with the student for 30 seconds.

      - Then divert your attention again back to the work at your desk.

   6. Do not respond to any other problem behavior.
APPENDIX E
FUNCTIONAL ANALYSIS PROTOCOL

Student Name: _____________  Teacher: _____________
Session: _________________  Date: _______________
Condition: **ESCAPE**

**Operational Definition and Measurement of Target Behaviors**

- **Target Behavior:** To be determined based on collaboration with teacher
  - **Definition:** Will be developed based on behavioral topography
  - **Dependent Measure:** Will be determined

**Data Collection Procedures and Other Behavioral Definitions**

1. Target Behavior = Recording scheme will be determined based on topography

**Session Duration:** 10 minutes

**Setting:** Classroom

**Type of activity:** Group Instruction

**Materials:** Any Work Related Materials

**Procedures:**

1. Seat student in designated area *Teacher will present class activity that in the past has been related to the occurrence of the target behavior*.

2. Say “[Student's Name], it’s time to listen to the teacher and join the group.”

3. Teacher will present student with instructions typical of the group activity.

4. Wait 5 s for independent initiation of activity

   - If student independently initiates task, experimenter will provide praise and deliver next command as needed.
   - If student does not initiate within 5 s, experimenter will use a verbal and gestural prompt (for example, say “[student, answer the question.]” while pointing to the teacher) and wait 5 s for initiation.
     - If student complies with the verbal/gestural prompt within 5 s, experimenter will provide praise and move to the next command as needed.
     - If the student does not comply within 5 s, experimenter will use physical guidance to have student comply (e.g., Say, “student,
answer the question,” while using gestural prompts to assist in handing you the pencil.)
  • DO NOT PRAISE STUDENT IF PHYSICAL GUIDANCE IS NEEDED.

5. Contingent on each occurrence of target behavior:
   • Remove work related materials and provide a 30s break.
   • Repeat the instruction after the 30s break.
   • DO NOT PROVIDE STUDENT WITH ANY ATTENTION.

6. Contingent on compliance with a verbal or verbal and gestural prompt:
   a. Provide descriptive praise
   b. REMEMBER: Do not provide praise if physical guidance was required.
   c. Point to the next problem and repeat instruction.

7. Do not respond to any other problem behavior.
APPENDIX F
PROCEDURAL INTEGRITY FOR FUNCTIONAL ANALYSIS CONDITIONS

<table>
<thead>
<tr>
<th>Student: _________________</th>
<th>Session: _________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher: _________________</td>
<td>Date: _________________</td>
</tr>
<tr>
<td>Observer: _________________</td>
<td>Condition: <strong>TANGIBLE</strong></td>
</tr>
</tbody>
</table>

This form is used to assess the level of procedural integrity for each implemented functional analysis **tangible** condition. Record if the researcher behaviors were implemented as planned (Yes) or not implemented as planned (No) during each FA control condition.

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant is seated in designated area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Researcher has restricted student access to preferred items available in the classroom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Researcher presents the student with identified activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contingent on problem behavior, researcher presents Student with preferred item for 30s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Researcher does not respond to other problem behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Researcher does not present academic demands to the student</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Repeated steps 3-5 for each 30 s interval** |     |    |     |
APPENDIX G

PROCEDURAL INTEGRITY FOR FUNCTIONAL ANALYSIS CONDITIONS

Student: _________________ Session: _______________

Teacher: _________________ Date: _________________

Observer: _________________ Condition: **CONTROL**

This form is used to assess the level of procedural integrity for each implemented functional analysis control condition. Record if the researcher behaviors were implemented as planned (Yes) or not implemented as planned (No) during each FA control condition.

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Participant is within designated area of target activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Researcher provided student with access to preferred materials available in the classroom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Researcher provides interactive play and attention every 30 s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Researcher does not respond to problem behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Researcher does not present academic demands to the student</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Repeated steps 3-5 for each 30 s interval*
**APPENDIX H**

**PROCEDURAL INTEGRITY FOR FUNCTIONAL ANALYSIS CONDITIONS**

<table>
<thead>
<tr>
<th>Student: ______________</th>
<th>Session: ______________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher: ______________</td>
<td>Date: _________________</td>
</tr>
<tr>
<td>Observer: ______________</td>
<td>Condition: <strong>ATTENTION</strong></td>
</tr>
</tbody>
</table>

This form is used to assess the level of procedural integrity for implemented functional analysis **attention** condition. Record if the researcher behaviors were implemented as planned (Yes) or not implemented as planned (No) during each FA attention condition.

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Participant is within designated area of target activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Teacher presents task related items to child</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Researcher interacts with student until student engages in task</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Researcher says, “I have to do my work now, it's time for work”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Researcher diverts attention to her work materials</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 7. Contingent on student exhibiting target behavior  
  a. Researcher provides a disapproving comment |   |   |   |
|  b. Interacts with the student for 30 seconds |   |   |   |
| 8. Following 30 seconds of interaction, researcher diverts attention back to the work materials |   |   |   |
| 8. Teacher does not respond to any other problem behavior |   |   |   |
| * Repeated steps 7-8 for each occurrence of target behavior |   |   |   |
APPENDIX I

PROCEDURAL INTEGRITY FOR FUNCTIONAL ANALYSIS CONDITIONS

Student: _________________    Session: _________________
Teacher: _________________    Date: _________________
Observer: _________________    Condition: ESCAPE

This form is used to assess the level of procedural integrity for each implemented functional analysis escape condition. Record if the researcher behaviors were implemented as planned (Yes) or not implemented as planned (No) during each FA demand condition.

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
</table>
1. Participant is within designated area of target activity                ____ |    ____ |    ____ |
2. Researcher presents student with identified task demand                  ____ |    ____ |    ____ |
3. Researcher provides verbal instructions to student to complete
   the identified task                                                       ____ |    ____ |    ____ |
4. Researcher waits 5 s for compliance                                       ____ |    ____ |    ____ |
   a. The student complies                                                   ____ |    ____ |    ____ |
      i. Researcher provides descriptive praise                               ____ |    ____ |    ____ |
      ii. Researcher moves to the next demand                                 ____ |    ____ |    ____ |
   b. The student does not comply with 5 s                                    ____ |    ____ |    ____ |
      i. Researcher restates instructions with verbal/gestural prompts        ____ |    ____ |    ____ |
      ii. Researcher waits 5 s for compliance                                  ____ |    ____ |    ____ |
A. Student complies
   1. Researcher provides descriptive praise                                  ____ |    ____ |    ____ |
   2. Researcher moves to the next demand                                     ____ |    ____ |    ____ |
B. Student does not comply                                                   ____ |    ____ |    ____ |
   1. Researcher restates the instructions and provides hand-over-hand guidance ____ |    ____ |    ____ |
5. Researcher does not respond to any other problem behavior                 ____ |    ____ |    ____ |
6. When student exhibits problem behavior
   a. Researcher removes task demand for 30 s                                  ____ |    ____ |    ____ |
   b. After 30 s, Researcher represents the task demand                       ____ |    ____ |    ____ |
* Repeat steps 3-6 for each demand sequence                                ____ |    ____ |    ____ |
APPENDIX J

FUNCTION-BASED INTERVENTION PROTOCOL (ATTENTION)

Student Name: ___________  Teacher: ___________
Session: __________________  Date: ___________

Operational Definition and Measurement of Target Behaviors

Target Behavior: Inappropriate Vocalizations
Definition: Verbal sounds or utterances (e.g., talking yelling, humming) that are irrelevant to the academic task or teacher-issued instructions or occur at an inappropriate time.

Dependent Measure: Partial Interval Recording

Replacement Behavior: Appropriate Engagement
Definition: Student’s body is oriented towards task or teacher, with eyes on academic materials or looking at teacher, and responds to academic demands when individually requested or whole-group requested (i.e., verbal response or gestural response).

Dependent Measure: Partial Interval Recording

Procedures:

1. Prior to presenting any task demands, the teacher will tell the target student “If you are good today, I will tell you “you did a good job.”

2. Teacher will present task demands as normal.

3. On a fixed-interval schedule of 30s, the student will receive 3 positive praise statements for the first occurrence of Appropriate Engagement that occurs after the 30s period.

4. Following the appropriate response, the researcher will cue the teacher to provide the positive attention using an index card. The teacher will deliver 3 praise statements/gestures (e.g., Great job!, I love the way you are working, Isaiah!, Good working! or giving a high 5 or thumb’s up).

5. Teacher will provide the 3 praise statements contingent on the index card cue every time it occurs.

6. Teacher will not respond to any other behaviors.
APPENDIX K
NON-FUNCTION BASED INTERVENTION PROTOCOL

Student Name: ____________  Teacher: ____________
Session: ___________________  Date: ___________

Operational Definition and Measurement of Target Behaviors

Target Behavior: Inappropriate Vocalizations

Definition: Verbal sounds or utterances (e.g., talking yelling, humming) that are irrelevant to the academic task or teacher-issued instructions or occur at an inappropriate time.

Dependent Measure: Partial Interval Recording

Replacement Behavior: Appropriate Engagement

Definition: Student’s body is oriented towards task or teacher, with eyes on academic materials or looking at teacher, and responds to academic demands when individually requested or whole-group requested (i.e., verbal response or gestural response).

Dependent Measure: Partial Interval Recording

Procedures:
1. Prior to presenting any task demands, the teacher will tell the target student “‘If you are good today, I will give you a sticker. If you get 5 stickers, you can go to the treasure box.’”
2. Teacher will present blank sticker chart to child and places on table in view of child.
3. Teacher will present task demands as normal.
4. On a fixed-interval schedule of 30s, the student will receive a sticker on the sticker chart for the first occurrence of Appropriate Engagement that occurs after the 30s period.
5. Following the appropriate response, the researcher will cue the teacher to provide the sticker using an index card. The teacher will say “you got a sticker” and place the sticker on the chart. No other attention will be provided.
6. At the end of the observation period, if the student has earned at least 5 stickers, the student will be allowed to choose one item from a “treasure box.”
7. Teacher will not respond to any other behaviors.
APPENDIX L

TREATMENT INTEGRITY CHECKLIST FOR FUNCTION-BASED INTERVENTION

Student: _________________  Session: _______________
Teacher: _________________  Date: _________________
Observer: _________________

This form is used to assess the level of treatment integrity for each session of the function-based intervention. Record if the teacher implemented as planned (Yes) or not implemented as planned (No) during each session.

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Participant is within designated area of target activity ______ ______  ___

2. Prior to presenting any task demands, teacher tells target student “If you are good today, I will tell you “you did a good job.” ______ ______  ___

3. Teacher presents task demands as normal. ______ ______  ___

4. Following the researcher/s cue (index card):
   i. The teacher delivers 3 praise statements/gestures ______ ______  ___

5. Teacher provides the 3 praise statements each time cue occurs. ______ ______  ___

6. Teacher does not respond to any other behaviors. ______ ______  ___
APPENDIX M

TREATMENT INTEGRITY CHECKLIST FOR NON-FUNCTION BASED INTERVENTION:
TOKEN ECONOMY

Student: _________________  Session: _______________
Teacher: _________________  Date: _________________
Observer: _________________

This form is used to assess the level of treatment integrity for each session of the non-function-based intervention. Record if the teacher implemented as planned (Yes) or not implemented as planned (No) during each session.

<table>
<thead>
<tr>
<th>Y</th>
<th>N</th>
<th>NA</th>
</tr>
</thead>
</table>

1. Prior to presenting any task demands, teacher tells target student, _____ _____ _____ “If you are good today, I will give you a sticker. If you get 5 stickers, you can go to the treasure box.”

2. Teacher presents blank sticker chart to child at the start of the observation period and places in view. _____ _____ _____

3. Contingent on occurrence of appropriate behavior
   a. Teacher delivers statement “You got a sticker.” _____ _____ _____
   b. Teacher places sticker on the chart _____ _____ _____

4. No other attention is provided. If student gets 5 stickers at the end of the observation period, child is allowed to draw one item from the “treasure box.” _____ _____ _____

Child met criterion: Y  N
Number of stickers earned: ______
Reward Chosen: _______________
APPENDIX N

THE INTERVENTION RATING PROFILE (IRP-15)

The purpose of this questionnaire is to obtain information that will aid in the evaluation of the intervention for _______. Please circle the number which best describes your agreement or disagreement with each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. This was an acceptable procedure for the child's problem behavior.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Most teachers would find this procedure appropriate for problem behaviors.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. This procedure was effective in changing the child's problem behavior.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I would suggest the use of this procedure to other teachers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. The child's problem behavior was severe enough to warrant use of this procedure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. Most teachers would find this procedure suitable for dealing with the child's problem behaviors.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I would be willing to use this procedure again.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. This procedure did NOT result in any negative side-effects for the child.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
9. This procedure would be appropriate for a variety of children.

10. This procedure was consistent with those I have used in the past.

11. This procedure was a fair way to deal with the child's problem behavior.

12. This was reasonable for the child's problem behavior.

13. I liked the procedure.

14. This procedure was beneficial in understanding this child's problem behavior.

15. Overall, this procedure was beneficial for the child.

Adapted from Martens, Witt, Elliott, & Darveaux, 1985.
APPENDIX O

INSTITUTIONAL REVIEW BOARD APPROVAL FORM

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

Institutional Review Board

118 College Drive #5147
Hattiesburg, MS 39406-0001
Tel: 601.266.6820
Fax: 601.266.5509
www.usm.edu/irb

HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the “Adverse Event Report Form”.
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 10051301
PROJECT TITLE: A Comparison of the Effects of a Function-Based Intervention to a Non-Function Based Intervention in Preschoolers
PROPOSED PROJECT DATES: 06/01/2010 to 06/01/2011
PROJECT TYPE: Dissertation or Thesis
PRINCIPAL INVESTIGATORS: Katherine Bellone
COLLEGE/DIVISION: College of Education & Psychology
DEPARTMENT: Psychology
FUNDING AGENCY: N/A
HSPRC COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 05/18/2010 to 05/17/2011

Lawrence A. Hosman, Ph.D.
HSPRC Chair

5-19-2010
Date
REFERENCES


